



SERVICE MANUAL

Model Series:

Product Type:	Commercial Color TV
Chassis	CL
Manual Part #:	3828VD0171F
Model Line:	H
Product Year:	2006

H27H38DT
H32H38DT

CONTENTS

General Information/Remote Controls.....	1
Installer 's Menu	2
Servicing/Troubleshooting	3
Model/Module Parts List	4
Exploded Views	5
Schematics	6

Published by
Technical Publications
Zenith Electronics Corporation
P.O. Box 240007
Huntsville, AL 35824

Copyright © March2006 by Zenith Electronics Corporation

Printed in U.S.A.

PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO-VIDEO PRODUCTS

IMPORTANT SAFETY NOTICE

This Manual was prepared for use only by properly trained audio-visual service technicians. When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Electronics Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. LG Electronics Corporation allows no deviations without prior approval. Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

CAUTION: Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

GRAPHIC SYMBOLS



The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of non-insulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

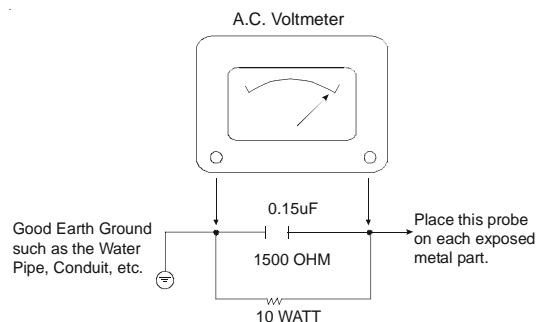
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items transported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After re-assembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by .15 mfd 150V AC type capacitor between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



X-RADIATION

1. Be sure procedures and instructions to all service personnel cover the subject of x-radiation. The only potential source of x-rays in current TV receivers is the picture tube. However, this tube does not emit x-rays when the HV is at the factory-specified level. The proper value is given in the applicable schematic. Operation at higher voltages may cause a failure of the picture tube or high-voltage supply and, under certain circumstances may produce radiation in excess of desirable levels.
2. Only factory-specified CRT anode connectors must be used.
3. It is essential that the service personnel have available an accurate and reliable high-voltage meter.
4. When the high-voltage circuitry is operating properly, there is no possibility of an x-radiation problem. Every time a color chassis is serviced, the brightness should be run up and down while monitoring the high voltage with a meter, to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. When troubleshooting and making test measurements in a product with a problem of excessively high voltage, avoid being unnecessarily close to the picture tube and the high voltage power supply. Do not operate the product longer than necessary to locate the cause of excessive voltage.
6. Refer to HV, B+, and shutdown adjustment procedures described in the appropriate schematics and diagrams (where used).

IMPLOSION

1. All direct view picture tubes are equipped with an integral implosion protection system; take care to avoid damage during installation.
2. Use only the recommended factory replacement tubes.

TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate airflow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using a cart or stand that has not been listed by Underwriters Laboratories, Inc. for use with its specific model of television receiver or generically approved for use with TVs of the same or larger screen size.
8. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO-VIDEO PRODUCTS

X-RADIATION

To prevent possible exposure to x-radiation caused by excessive CRT anode voltage, the Digital CL chassis incorporate a “High Voltage Shutdown” circuit. This circuit senses the level of a flyback pulse from the “Flyback Transformer” representative of the actual high voltage on the CRT anode. When this level exceeds a predetermined voltage, the circuit shuts down the TV set, preventing further generation of anode voltage.

SHUTDOWN CIRCUIT OPERATION

The flyback pulse voltage from pin 10 of T402 (Flyback Transformer) is peak detected (rectified) by the action of diode D444 and capacitor C450. This forms a DC voltage appearing on R419 representative of the CRT anode voltage (HV) produced by T402. This voltage is divided down by precision resistors R419, R423, R420 and R424. This lower voltage appears on the zener diode ZDX447; when this voltage exceeds by 0.7 Vdc the “zener voltage” Q403 enters in saturation mode and then the HV shutdown occurs (pin 49 of IC100).

CRT ANODE HIGH VOLTAGE MEASUREMENT PROCEDURE

Each CRT screen size has its own safe operating anode and shutdown voltage. Critical safety components (designated with an ‘X’ in the component designator) are designed to operate the CRT at a safe operating anode voltage and provide proper shutdown thresholds. If replacement of any of these components are deemed necessary, it is important to use original type LG Electronics components. After replacement is made, confirm proper anode voltage using the following procedure.

Measurement of the CRT anode voltage must be performed using a high impedance-high voltage meter, with no raster on the screen, and operating at nominal horizontal frequency, 15.75 KHz (NTSC signal).

After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode. Turn the television ‘on’ and confirm a good signal is being displayed. Reduce Brightness and Contrast settings until the picture is well extinguished.

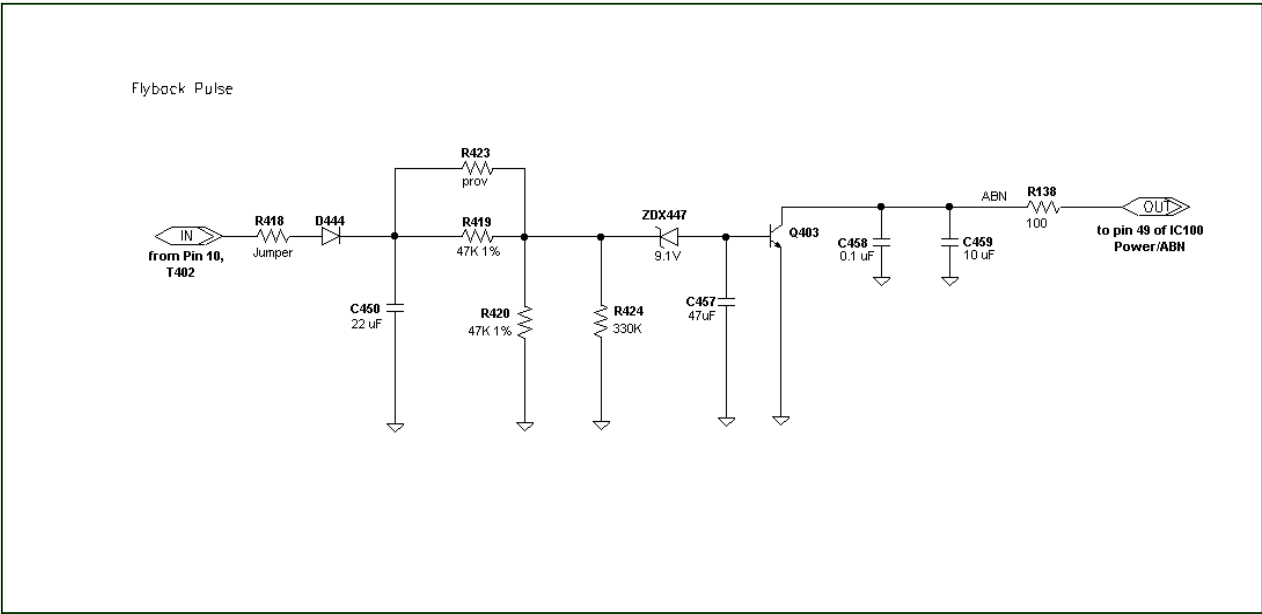
Observe the anode voltage meter reading and compare with the table below for the proper CRT screen size. If the voltage reading is higher than the maximum, verify circuit component values and proper operation.

CRT Anode Voltage		
CRT Screen Size	Nominal Anode Voltage	Max. Shutdown Voltage
	(KV)	(KV)
27"	30 ± 1.0	36

COMPONENTS WITH ANY INFLUENCE IN HV INCREASE
<i>Fly-Back Transformer</i>
<i>Deflection Yoke</i>
<i>CX404</i>
<i>CX406</i>
<i>CX405</i>
<i>ICX3751</i>

HV SHUTDOWN PROCEDURE.

- After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode
- Remove jumper wire from RX3750.
- Connect a variable Resistor (1 Mohm) in location RX3750.
- Access **Video Menu** and adjust Brightness and Contrast controls for minimum screen luminance (beam current to 0 mA).
- Wait until the **Video Menu** or display disappears.
- Increase (from zero) slowly the resistance value until shutdown occurs.
- Measure High Voltage shutdown.



INSTALLERS MENU

Use the Installer Menu to set up or change operational settings.

See detailed descriptions of the Installer Menu items on the following pages

Installer's menu items can be accessed by using the optional installer's remote control. Just press and hold MENU (about 8 seconds) until the menu disappears, then press 9, 8, 7, 6, then ENTER. To remove the Installer's Menu, press ENTER repeatedly. Any changes you make will be stored in non-volatile memory.

The Installer's menu opens with the main menu. Use MENU and SELECT to sequence through the installer menus and submenus. Use SELECT or TV/FM to scroll up/down in the menus and sub-

menus. To change a setting use the Left/Right ADJ keys. Press ENTER to return to main menu.

Using the Installer's Menu

Items 0-I - 103-I are accessible only in the Installer's Menu. Their numbers, descriptions, ranges, factory default settings, and a place for listing any changes made on site are given below and on the following pages.

The Factory Menu that is intended for qualified service technicians only, is not shown. XX-F Menu Items (not shown here)

are service type adjustments and only qualified technicians having specialized test equipment should access them.

The image shows a typical installer menu screen. It features a list of menu items: INSTALLERS, INSTALLERS1 (highlighted with a right arrow), INSTALLERS2, INSTALLERS3, INSTALLERS4, INSTALLERS5, INSTALLERS6, and INSTALLERS7. Below this list are two lines of text: TV MICRO V2.08 and D2A CARD V2.05. At the bottom, there is a status bar with the text D2A CARD, MICRO COMM, and STATUS, followed by an OK button.

Typical Installer Menu

Menu Item	Function	Value Range	Default Value	Brief Description of Function and Comments
0-I.	INSTALLER SEQ	0 - 3	0	Leave default set at 0.
1-I.	POWER MANAGE	0 - 7	0	Sets number of hours of no activity before auto shutoff.
2-I.	AC ON	0 / 1	0	Set to 1 to enable auto turn on at power up.
3-I.	BAND-AFC	0 - 7	0	Sets Tuning band.
4-I.	STRT CHANNEL	0 - 255	255	Channel at turn-on (255 for last Channel). For digital channels, use with item 101-I Start Minor Channel.
5-I.	CHAN LOCK	0 / 1	0	When set to 1, cannot tune from current channel.
6-I.	GHOST CH	0 / 1	0	Set to 1 to enable Ghost Channel display.
7-I.	START VOLUME	0-63, 255	255	Volume level at TV turn-on (Set 255 to retain last level).
8-I.	MIN VOLUME	0 - 63	0	Minimum volume setting.
9-I.	MAX VOLUME	0 - 63	63	Maximum volume setting.
10-I.	MUTE DISABLE	0 / 1	0	Set to 1 to disable mute function.
11-I.	KEY DEFEAT	0/ 1	1	Set to 1 to disable the front panel keyboard MENU key.
12-I.	NOT USED			
13-I.	SCAN MODE	0 / 1	0	Puts TV On-Off event in Ch Up/Down sequence.
14-I.	NOT USED			
15-I.	SLEEP TIMER	0 / 1	1	Set to 1 to enable Sleep Timer.
16-I.	EN TIMER	0 / 1	1	Set to 1 to enable Timer.
17-I.	ALARM	0 / 1	1	Set to 1 to enable Alarm.
18-I.	NOT USED			
19-I.	NOT USED			
20-I.	FEATURE LEVEL	0 / 1	1	Zen 1 Leave default set 1 (1 Zen1).
21-I.	V-CHIP	0 / 1	1	Set to 1 to enable V-Chip (Parental Control).
22-I.	MAX BLK HRS	0 - 99	12	Sets number of Parental Control blocking hours.
23-I.	CAPTION LOCK	0 / 1	0	Set to 1 to retain caption setting at turn off.
24-I.	TEXT MODE	0 / 1	1	Set to 1 to add Text option to closed caption menu.
25-I.	FUNCTION PRE.	0 - 3	0	Controls channel preview in Pay-Per-View function menu.

INSTALLERS MENU

Installer Menu Items 26-I through 63-I

Menu Item	Function	Value Range	Default Value	Brief Description of Function and Comments
26-I.	NOT USED			
27-I.	NOT USED			
28-I.	CH OVER RIDE	0 / 1	1	When set to 0, limits direct access to favorite channels and locks Auto Program.
29-I.	OLD OCV	0 / 1	0	OCV should set to 1.
30-I.	ACK MASK	0 / 1	0	M.P.I. communication parameter.
31-I.	POLL RATE	20 - 169	94	M.P.I. communication parameter.
32-I.	TIMING PULSE	186 - 227	204	M.P.I. communication parameter.
33-I.	NOT USED			
34-I.	CAMPOR EN	0 / 1	1	Set to 1 to enable the front AUX (Campor) input.
35-I.	SUP. PORT YUV	0 / 1	0	Reserved for future use.
36-I.	FRNT Y-C EN	0 / 1	1	Set to 1 to enable the front S-Video input.
37-I.	REAR Y-C EN	0 / 1	1	Set to 1 to enable the rear S- Video input.
38-I.	YPRPB EN	0 / 1	1	Set to 1 to enable the component input.
39-I.	REAR VIDEO EN	0 / 1	1	Set to 1 to enable rear AUX video input.
40-I.	AUTO CAMPOR	0 / 1	1	Set to 1 to automatically switch to Campor.
41-I.	NOT USED			
42-I.	AUTO FRNT Y-C	0 / 1	1	Set to 1 to automatically switch to front S-Video input.
43-I.	NOT USED			
44-I.	NOT USED			
45-I.	NOT USED			
46-I.	STRT AUX SRCE	0-2, 255	255	Sets the starting AUX source.
47-I.	AUX STATUS	0 / 1	0	Set to 1 for M.P.I. AUX source reported as Channel number instead of Channel 0.
48-I.	DIS SETUP M	0 / 1	0	Set to 1 to disable Setup menu.
49-I.	DIS AUDIO M	0 / 1	0	Set to 1 to disable Audio menu.
50-I.	DIS VIDEO M	0 / 1	0	Set to 1 to disable Video menu.
51-I.	DIS VCHIP M	0 / 1	0	Set to 1 to disable V-Chip (Parental Control) menu.
52-I.	DIS SOURCE M	0 / 1	0	Set to 1 to disable Source menu.
53-I.	DIS CHTIME M	0 / 1	0	Set to 1 to disable Channel-Time on-screen display.
54-I.	EN SET COL	0 / 1	0	Set to 1 to enable custom color for the Setup menu.
55-I.	FOR SETUP M	0 - 7	6	Custom foreground color for the Setup menu.
56-I.	BCK SETUP M	0 - 7	4	Custom background color for the Setup menu.
57-I.	EN AUDIO COL	0 / 1	0	Set to 1 to enable custom color for the Audio menu.
58-I.	FOR AUDIO M	0 - 7	3	Custom foreground color for the Audio menu.
59-I.	BCK AUDIO M	0 - 7	5	Custom background color for the Audio menu.
60-I.	EN VIDEO COL	0 / 1	0	Set to 1 to enable custom color for the Video menu.
61-I.	FOR VIDEO M	0 - 7	4	Custom foreground color for the Video menu.
62-I.	BCK VIDEO M	0 - 7	7	Custom background color for the Video menu.
63-I.	EN PTL COL	0 / 1	0	Set to 1 to enable custom color for the V-Chip (Parental Control) menu.

INSTALLERS MENU

Installer Menu Items 64-I through 88-I

Menu Item	Function	Value Range	Default Value	Brief Description of Function and Comments
64-I.	FOR PTL M	0 - 7	6	Custom foreground color for the V-Chip (Parental Control) menu.
65-I.	BCK PTL M	0 - 7	4	Custom background color for the V-Chip (Parental Control) menu.
66-I.	EN SRC COL	0 / 1	0	Set to 1 to enable custom color for the Source menu.
67-I.	FOR SRC M	0 / 7	3	Custom foreground color for the Source menu.
68-I.	BCK SRC M	0 - 7	4	Custom background color for the Source menu.
69-I.	EN CHT COL	0 / 1	1	Set to 1 to enable custom color for the Channel-Time on-screen display.
70-I.	FOR CHT COL	0 - 7	1	Custom foreground color for the Channel-Time display.
71-I.	BCK CHT COL	0 - 7	1	Custom background color for the Channel-Time display.
72-I.	NOT USED			
73-I.	CH NOT AVBLE	0 / 1	0	When set to 1 and channel over ride is set to 0, "NOT AVAILABLE" message is displayed when directly accessing a channel not in the favorite channel list.
74-I.	CH-TIME SIZE	0 / 1	0	When set to 1 and transparent background is selected for Channel-Time display, (foreground color = background color and custom color enabled) a large channel number is displayed instead of the normal Channel-Time on-screen display.
75-I.	REVERT CH	0 / 1	0	When set to 1 and loss of M.P.I. communication occurs, TV tunes to Start Channel.
76-I.	DEFEAT XDS	0 / 1	0	When set to 1, XDS display program information will not appear.
77-I.	NOT USED			
78-I.	UPN MSB	0 - 255	XX	User programmable number, most significant byte. (Line - Day)
79-I.	UPN MSB1	0 - 255	XX	User programmable number, most significant byte- 1. (Week)
80-I.	UPN MSB2	0 - 255	XX	User programmable number, most significant byte- 2. (SN - HIGH)
81-I.	UPN LSB	0 - 255	X	User programmable number, least significant byte. (SN - LOW)
82-I.	CHKSM ERROR	0 / 1	1	Enforces rigid M.P.I. checksum.
83-I.	HANDSHK TIME	0 - 5	0	Relaxes M.P.I. timing to be compatible with PC based Windows controlled systems.
84-I.	PERMANENT BLK	0 / 1	0	Set to 1 to remove block hours setting for Parental Control and make blocks permanent.
85-I.	A MUTE TIME	0 - 254	35	Controls muting audio delay time when switching between AUX sources.
86-I.	V MUTE TIME	0 - 254	40	Controls muting video delay time when switching between AUX sources.
87-I.	NOT USED			
88-I.	EN NOISE MUTE	0 / 1	1	When set to 1, the audio signal volume is limited to a minimum value if no signal is being received from the broadcaster.

INSTALLERS MENU

Installer Menu Items 89-I through 103-I

Menu Item	Function	Value Range	Default Value	Brief Description of Function and Comments
89-I.	POKE ENABLE	0 / 1	0	When set to 1, writing to Non - volatile memory through M.P.I. is enabled.
90-I.	KEY LOCK	0 / 1	0	When set to 1, front keyboard functionality is disabled.
91-I.	NOT USED			
92-I.	NOT USED			
93-I.	NOT USED			
94-I.	NOT USED			
95-I.	AUDIO MD DISP	0 / 1	1	When set to 1, Audio Mode Information is enabled to appear in the Channel Time Display.
96-I.	NOT USED			
97-I.	NOT USED			
98-I.	NOT USED			
99-I.	NOT USED			
100-I.	ATSC TUNE MD	0 / 1	0	Sets ATSC tuning mode. Set to 0 for virtual channel, set to 1 for physical channel.
101-I.	STRT MINOR CH	0 - 255	0	Sets the starting minor channel. For NTSC set to 0. If not 0, sets minor channel number. Set to 255 to show last tuned channel at turn on.
102-I.	NOT USED			
103-I.	A RATIO LOCK	0 / 1	0	Set to 1, to retain current aspect ratio at turn off. At turn on, last set aspect ratio will be used. Set to 0 to reset picture aspect ratio to default at TV turn on.

Detailed Descriptions of Installer Menu Items

0-I. INSTALLER SEQUENCE

Gives access to Installer Menu depending on the code selected.

0 = 9876 1 = 4321
2 = 1478 3 = 3698

1-I. POWER MANAGE (Power Management)

Determines hours of no activity before automatic shutoff. The POWER MANAGE function is for saving energy. When set to 0, Power Manage is OFF.

Settings range from 0 - 7, with 1 - 7 representing the hours that the TV will remain on, unless there has been activity from either the control panel or remote control.

*M.P.I. Multiple Protocol Input: LG protocol for remote control of TV through RJ11 (M.P.I.) jack on TV connections panel.

2-I. AC ON (AC Power Switchable)

Allows the TV to turn ON just by applying AC

power. Pressing the ON button is not necessary. This is desirable when the TV is plugged into a cable box or a power outlet controlled by a wall switch. Use ADJ to select 0 or 1, where 0 is the default is OFF, and 1 is ON.

Note: When set to 1 (ON), the TV does not respond to ON/OFF commands from either the remote or the control panel, and the SLEEP TIMER is also not functional.

3-I. BAND/AFC (Band/Automatic Frequency Control)

There are 8 possible settings for this option:

0 = Broadcast Fixed 4 = Broadcast AFC
5 = CATV Fixed 1 = CATV AFC
6 = HRC Fixed 2 = HRC AFC
7 = ICC Fixed 3 = ICC AFC

Channels are accessed faster when fixed modes are used. The AFC (search modes) should only be used when some channels are not on nominal frequencies. **Note:** BAND is automatically set by AUTO

INSTALLERS MENU

Detailed Descriptions for Installer Menu Items 4-I through 13-I

PROGRAM. If some channels were not found by AUTO PROGRAM, select the appropriate AFC setting here and add the channels using the ADD/DEL/BLNK option in the Setup Menu.

4-I. STRT CHANNEL (Start Channel)



Important: For NTSC start channel, item 101-I STRT MINOR CHANNEL, must be set to 0. When active, this function allows you to determine the initial channel number when the TV is turned ON. (To set a digital channel, use with Item 101 Start Minor Channel.) This feature is useful for an in-house information channel, since the TV would always select that channel when it is turned on. Setting this to 255 causes the last channel viewed when TV was turned Off to be the tuned to channel when the TV is turned On again. The range of values is 0 - 255. Use ADJ (Adjust) keys to choose numbers for the start channel. Start Channel should be a channel with an active signal.

5-I. CHAN LOCK (Channel Lock)

CHAN LOCK is ideal if a cable box (or similar) is the sole source for programming—and the TV must always be on the same channel. Changing channels with Channel Up/Down or keypad numbers is impossible. Channel Lock is inactive when set to 0 (default). Generally, this feature is used in conjunction with START CHANNEL (item 4-I.) where the start channel may, for example, be set to 3 or 4. If the start channel is 3, then the TV will remain on channel 3.

Note: When CHANNEL LOCK is active and CHANNEL OVER RIDE is disabled, AUTO PROGRAM is not functional.

6-I. GHOST CH (Ghost Channel)

When set to 1, the current channel number is displayed in the upper right corner of the picture. The number moves slightly to prevent damage to the screen. The default is "0" or Off. **Note:** When captions are On, "Ghost Channel" is not displayed.

7-I. START VOLUME

This function allows the Installer to determine the initial volume level setting when the TV is turned ON. This feature is useful for an in-house information channel, since the TV would always select that Volume level when it is turned on. The range of values are 0 - 63, 255. If 255 is selected, the current volume level will be retained in memory

when the TV is turned off. At TV turn on, Volume level is automatically set to the previous or last level.

8-I. MIN VOLUME (Minimum Volume)

This function determines the minimum volume level allowable with the VOLUME (VOL) Up/Down control. In this way, for example, someone cannot set the sound too low to hear. The range is from 0 to 63 change values with ADJ (adjust). The factory default is 0, which provides full range of volume control. It may be best to set the same value on every TV.

Note: The minimum volume level cannot have a value setting higher than in the MAX VOLUME level (described below).

9-I. MAX VOLUME (Maximum Volume)

This function determines the maximum volume level allowable with the VOLUME Up/Down control. In this way, for example, someone cannot set the sound level high enough to disturb others. The range is 0 to 63, with 63 as the default which gives the user the full range of volume control. Change values with ADJ Left/Right keys. It may be best to set the same value on every TV.

Note: The maximum volume level cannot have a value setting lower than the MIN VOLUME level (See item 8 -I).

10-I. MUTE DISABLE

Enables or disables sound mute function. If set to 1, sound cannot be muted. If set to 0, sound can be muted.

11-I. KEY DEFEAT

Enables or disables the menu key on the front panel keyboard. Set to 0 to enable, set to 1 to disable. If set to 1, Key lock appears if MENU key on front panel is pressed.

12-I. NOT USED

13-I. SCAN MODE

Allows variation in the On/Off setup with CHANNEL Up/Down. You may opt for TV channels only or TV channels + Off/On with the following settings for Scan Mode. Scan mode Characteristics:

0 = Channel Up/Down keys Change channels only.
1 = Channel Down below the lowest channel (or channel up higher than the highest channel) and the TV turns off.

INSTALLERS MENU

Detailed Descriptions for Installer Menu Items 14-I through 36-I

14-I. NOT USED

15-I. SLEEP TIMER

When set to 1, the Sleep Timer feature is available to the user (but no message is displayed prior to turn-off). When set to 0, the Sleep Timer is not functional.

16-I. EN. TIMER

Set to 1, On/Off Timer functions are available to end user. Set to 0 to disable Timer functions.

Note: Clock must be set in order to use Timers.

17-I. ALARM

Gives you the option of making the Alarm function available to the user. Set to 1, Alarm function is available to user. Set to 0 to disable the Alarm function. Note: Clock must be set in order to set the Alarm.

18-I. NOT USED

19-I. NOT USED

20-I. FEATURE LEVEL

Default set to ZEN 1 for Zenith IR remote control operation. Set 0, P LBL for Zenith Private Label IR remote control operation. WARNING: Do not change the default value unless you have the proper remote control to operate the TV.

21-I. V-CHIP

Set to 1 to activate V-Chip (Parental Control); have it available to user to filter or control or restrict programming content. Set to 0 to turn V-Chip feature off, not available to user; no programming restrictions can be set.

22-I. MAX BLK HRS

Set 0 to 99 for the maximum V-Chip (Parental Control) block hours. Default setup is for 12 blocking hours.

23-I. CAPTION LOCK

Set to 1 to restore previous Caption On/Off state after TV turns Off. When set to 0, Captions are always Off, when TV is initially turned On.

24-I. TEXT MODE

Determines whether TEXT 1, TEXT 2, TEXT 3, or TEXT 4 decoding is enabled when TEXT is turned on

(either from the Setup Menu or directly with CC on the remote).

TIP: Set Text Mode to 1 only if text is offered in your video system.

25-I. FUNCTION PRE

Set to 0 to suppress CHANNEL PREVIEW from the FUNCTION menu with some Pay-Per-View systems.

26-I. NOT USED

27-I. NOT USED

28-I. CH. OVER RIDE (Channel Override)

When set to 1, the user can select channels with either Channel Up/Down or by direct keypad entry. When set to 0, only those channels that are entered for scanning may be selected by direct keypad entry. Note: If set to 0, Auto Program is locked; (as shown on Setup menu) channel search is not available.

29-I. OLD OCV (On Command Video™)

Set to 1 for operation with systems from On Command Corporation.

30-I. ACK MASK

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

31-I. POLL RATE

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

32-I. TIMING PULSE

M.P.I. Communication Parameter. Leave at default setting unless changed by Pay-Per-View provider.

33-I. NOT USED

34-I. CAMPORT ENABLE

Set to 1 to enable the front AUX (Campport) input. Set to 0 to disable front AUX input.

35-I. SUP. PORT YUV

Reserved for future use.

36-I. FRONT Y-C EN.

Set to 1 to enable the front S-Video input. Set to 0 to disable front S-Video input.

INSTALLERS MENU

Detailed Descriptions for Installer Menu Items 37-I through 59-I

37-I. REAR Y-C EN.

Set to 1 to enable the rear S-Video input.
Set to 0 to disable the rear S-Video input.

38-I. YPrPb EN.

Set to 1 to enable rear Component Video input. Set to 0 to disable rear Component Video input.

39-I. REAR VIDEO EN.

Set to 1 to enable rear AUX (Video) input.
Set to 0 to disable rear AUX input.

40-I. AUTO CAMPORT

Set to 1 to automatically switch to Camport when equipment is connected to front Video input. Set to 0 to disable front Video automatic source selection. Note: If disabled, do not connect any jacks.

41-I. NOT USED

42-I. AUTO FRONT Y-C

Set to 1 to automatically switch viewing source to front S-Video input if equipment is connected.
Set to 0 to disable front S-Video auto source selection. Note: If disabled, do not connect any jacks.

43-I. NOT USED

44-I. NOT USED

45-I. NOT USED

46-I. STRT AUX SRCE

Sets the starting AUX source.

47-I. AUX STATUS

Set to 1 for M.P.I. AUX source to be reported as a channel number instead of channel 0. Set to 0 to disable AUX identification change.

48-I. DIS SETUP M

Set to 1 to disable the Setup menu. Setup menu will not appear. Set to 0 to enable the Setup menu.

49-I. DIS AUDIO M

Set to 1 to disable the Audio menu. Audio menu will not appear. Set to 0 to enable the Audio menu.

50-I. DIS VIDEO M

Set to 1 to disable the Video menu. Video menu will not appear. Set to 0 to enable the Video menu.

51-I. DIS VCHIP M

Set to 1 to disable V-Chip menu. V-Chip menu will not appear. Set to 0 to enable the V-Chip menu.

52-I. DIS SOURCE M

Set to 1 to disable Source menu. Source menu will not appear. Set to 0 to enable the Source menu.

53-I. DIS CH-TIME

Set to 1 to disable the Channel-Time display. Channel-Time display will not appear.
Set to 0 to enable the Channel-Time display.

54-I. EN SET COL

Set to 1 to enable custom color settings for the Setup menu. Set to 0 to disable custom color settings for the Setup menu.

55-I. FOR SETUP M (Setup Menu Foreground Color)

Set according to Color Chart.

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

56-I. BCK SETUP M (Setup Menu Background Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

57-I. EN AUDIO COL

Set to 1 to enable custom color settings for the Audio menu. Set to 0 to disable custom color settings for the Audio menu.

58-I. FOR AUDIO COL (Audio Menu Foreground Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

59-I. BCK AUDIO COL (Audio Menu Background Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

INSTALLERS MENU

Detailed Descriptions for Installer Menu Items 60-I through 75-I

60-I. EN VIDEO COL

Set to 1 to enable custom color settings for the Video menu. Set to 0 to disable custom color settings for the Video menu.

61-I. FOR VIDEO M (Video Menu Foreground Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

62-I. BCK VIDEO COL (Video Menu Background Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

63-I. EN PTL COL

Set to 1 to enable custom color settings for the V-Chip menu. Set to 0 to disable custom color settings for the V-Chip menu.

64-I. FOR PTL M (V-Chip Menu Foreground Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

65-I. BCK PTL M (V-Chip Menu Background Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

66-I. EN SRC COL

Set to 1 to enable custom color for the Source menu. Set to 0 to disable custom color for the Source menu.

67-I. FOR SRC M (Source Menu Foreground Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

68-I. BCK SRC M (Source Menu Background Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

69-I. EN CH-T COL

Set to 1 to enable custom color for the Channel-Time display. Set to 0 to disable custom color for the Channel-Time display.

70-I. FOR CH-T COL (Channel-Time Display Foreground Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

Note: If foreground and background color are the same, menu background is transparent.

71-I. BCK CH-T COL (Channel-Time Display Background Color)

0 = Black	3 = Yellow	6 = Cyan
1 = Red	4 = Blue	7 = White
2 = Green	5 = Violet	

Note: If foreground and background color are the same, menu background is transparent.

72-I. NOT USED

73-I. CH NOT AVBLE

When set to 1 and channel override is set to 0, "NOT AVAILABLE" message is displayed when directly accessing a channel not in the favorite channel list. **(Applies to NTSC Channels Only.)**

74-I. CH-TIME SIZE

When set to 1 and transparent background is selected for Channel-Time display, (foreground color = background color and custom color enabled) a large channel number is displayed instead of the normal Channel-Time display.

75-I. REVERT CH

When set to 1 and loss of M.P.I. communication occurs, TV automatically tunes to the specified Start Channel.

INSTALLERS MENU

Detailed Descriptions for Installer Menu Items 76-I through 103-I

76-I. DEFEAT XDS

Set to 1 to disable XDS display. Set to 0 to enable XDS display. XDS data (provided at the discretion of the broadcaster), is available only on analog channels. After a channel change, wait 5 seconds then press ENTER to see XDS data, if available.

77-I. NOT USED

78-I. UPN MSB

User programmable number, most significant byte readable by M.P.I. command.

79-I. UPN MSB-1

User programmable number, most significant byte-1 readable by M.P.I. Command.

80-I. UPN MSB-2

User programmable number, most significant byte-2 readable by M.P.I. command.

81-I. UPN LSB

User programmable number, least significant byte readable by M.P.I. command.

82-I. CHKSM ERROR

Enforces rigid M.P.I. checksum validation.
Set to 1 for validation.
Set to 0 to turn off.

83-I. HANDSHK TIME

Adds an additional delay to the handshake time which is 64 msec, thus relaxing M.P.I. timing requirements to be compatible with PC based Windows controlled systems, range is 0 - 5.
Set to 0 to retain standard 64 msec delay.
Set to 1 - 5 to increase @ 16 msec ea., the delay up to 144 msec.

84-I. PERMANENT BLK

Allows Parental Control blocking schemes to be permanent by removing the blocking hours function. Set to 1 to install Parental Control blocking restrictions permanently. Set to 0 for user-specified hours control of blocking schemes.

85-I. A MUTE TIME

Controls audio muting delay time when switching between AUX sources. Range is 0 to 254 msec.

86-I. V MUTE TIME

Controls video muting delay time when switching between AUX sources. Range is 0 to 254 msec.

87-I. NOT USED

88-I. EN NOISE MUTE

When set to 1, the audio signal volume is limited to a minimum value while receiving no signal from the broadcaster.

89-I. POKE ENABLE

When set to 1, writing to Non-volatile Memory thru M.P.I. Is enabled.

90-I. KEY LOCK

When set to 1, front keyboard functionality is disabled. When set to 0, keyboard is enabled.

91-I. NOT USED

92-I. NOT USED

93-I. NOT USED

94-I. NOT USED

95-I. AUDIO MD DISP

When set to 1, Audio Mode Information is enabled to appear as part of the Channel-Time Display.

96-I. NOT USED

97-I. NOT USED

98-I. NOT USED

99-I. NOT USED

100-I. ATSC TUNE MD (ATSC Tuning Mode)

Sets ATSC tuning mode. Set to 0 for virtual channel, set to 1 for physical channel.

101-I. STRT MINOR CH (Start Minor Channel)

Sets the starting minor digital channel number. For NTSC set at 0. Not 0, sets digital minor start channel number. Used with item 4-I Start Channel. Set the major channel number in 4-1 and the minor digital dash number in item 101-I. At TV turn on, start channel number is automatically tuned in. Set to 0 if item 4-I is set to 255 for last tuned channel.

102-I. NOT USED

103-I. A RATIO LOCK (Aspect Ratio Lock)

When set to 1, current picture aspect ratio is retained at power off. At power on, previous aspect ratio will be used. If set to 0, resets aspect ratio to default setting at TV turn on.

FACTORY MENU

DEFLECTION 1

0-F VL (Vertical Linearity)

Adjust so that the boundary line between upper and lower half is in accord with geometric horizontal center of the CPT.

1-F VA (Vertical Amplitud)

Adjust so that the circle of a digital circle pattern may be located within the effective screen of the CPT.

2-F SC (Vertical S-Correction)

Adjust so that all distance between each horizontal lines are to be the same.

3-F VS (Vertical Shift)

Adjust so that the horizontal center line of a digital circle pattern is in accord with geometric horizontal center of the CPT.

4-F HS (Horizontal Shift)

Adjust so that the vertical center line of a digital circle pattern is in accord with geometric vertical center of the CPT.

5-F EW (Horizontal Width)

Adjust to that a digital circle pattern looks like exact circle.

6-F ET (East-west Trapezium)

Adjust to make the length of top horizontal line same with it of the bottom horizontal line.

7-F EP (East-west Parabola)

Adjust so that middle portion of the outermost left and right vertical line looks like parallel with vertical lines of the CPT.

8-F CRNU (Upper Corner)

Adjust until symmetries upper corners of the screen.

9-F CRNL (Lower Corner)

Adjust until symmetries lower corners of the screen.

10-F BOW

Adjust the left and right crooked line on upper and lower side.

11-F ANGLE

Adjust the vertical slope.

12-F CRNU6 (Upper Corner(6TH))

More detail adjusts until symmetries upper corner of the screen.

13-F CRNL6 (Lower Corner(6TH))

More detail adjusts until symmetries lower corner of the screen.

DEFLECTION 2

14-F EHTH (EHT Compensation Threshold)

Threshold for second gains of static horizontal and vertical EHT compensation.

15-F EHT S (EHT Static Time constant)

EHT Static time constant for horizontal and vertical amplitude compensation.

16-F EHTV1 (Static Vertical Comp. (1st Gain)) 1st Gain for Static Vertical Amplitude Compensation +/-100%, for beam current<EHT_THRES.

17-F EHTV2 (Static Vertical Comp. (2nd Gain)) 2nd Gain for Static Vertical Amplitude Compensation +/-100%, for beam current>EHT_THRES.

18-F EHTH1 (Dynamic Horizontal Comp. (1st Gain)) 1st Gain for Dynamic Horizontal Amplitude Compensation +/-100%, for beam current<EHT_THRES.

19-F EHTH2 (Dynamic Horizontal Comp. (2nd Gain)) 2nd Gain for Dynamic Horizontal Amplitude Compensation +/-100%, for beam current>EHT_THRES.

20-F EHT F (EHT Dynamic Time constant)

21-F EHTP1 (1st Gain for Dynamic Horizontal Phase) 1st Gain for Dynamic Horizontal Phase Compensation +/-100%, for beam current<EHT_THRES.

22-F EHTP2 (2nd Gain for Dynamic Horizontal Phase) 2nd Gain for Dynamic Horizontal Phase Compensation +/-100%, for beam current>EHT_THRES.

23-F OSD P

Horizontal Position for menus.

VIDEO-FI 1

24-F CLMPST

Clamping Measurement Start 1. Start of Clamping Measurement pulse for the ADC1. Range : 0 to 63.

25-F PLLTC

Horizontal PLL Time Constant. Range : 0 to 3.

26-F YC DELAYRF

Luminance Delay for RF input source. Range : -8 to 7.

FACTORY MENU

27-F TINT RF

Internal Tint Control for RF input source. Range : -128 to 127.

28-F SCADJ

Chroma Sub-Carrier adjust register. Range : 0 to 63.

29-F AGCMD

Automatic Gain Control Method. Range : 0 to 3.

30-F ACCLIMRF

Automatic Color Control Limitation for RF input source. Range : 0 to 31.

31-F CLRANGE

Chroma Lock Range register. Range : 0 to 3

32-F CDYUVIN

Color Decoder YUV input. Range : 0 to 1.

33-F CDYUVTNT

Color Decoder YUV Tint Control for YUV input Source. Range : -256 to 255.

34-F DISCOMB

Disable or enable the Comb Filter. Range : 0 to 1.

35-F VDG

Vertical Difference Gain to reduce Hanging dots. Range : 0 to 3.

36-F HDG

Horizontal Difference Gain to reduce Cross-Luminance. Range : 0 to 3.

37-F VPK

Vertical Peaking Gain. Range : 0 to 15.

38-F REMDEL2

Comb Filter Compensation Delay for ADC2. Range : 0 to 1.

VIDEO-FI 2

39-F REMDEL1

Comb Filter Compensation Delay for ADC1. Range : 0 to 1.

40-F INCOMB

Comb Filter Input Select. Range : 0 to 2.

41-F YCTCOMB

YC through Comb Filter. Range 0 to 1.

42-F AGCADJ1

Manual AGC Adjust for ADC1. Range : 0 to 63.

43-F AGCADJ2

Manual AGC Adjust for ADC2. Range : 0 to 63.

44-F YUVMAT

Color Matrix for component input. Range : 0 to 2.

45-F YUV TINT

Tint Control for YUV input. Range : -63 to 63.

46-F YUV BRT

Brightness Control for YUV input. Range : -128 to 127.

47-F YUV CON

Contrast Control for YUV input. Range : 0 to 63.

48-F RG YPBPR

Red Gain offset for YPbPr input. Range : 0 to 511.

49-F BG YPBPR

Blue Gain offset for YPbPr input. Range : 0 to 511.

50-F GG YPBPR

Green Gain offset for YPbPr input. Range : 0 to 511.

51-F RC YPBPR

Red Cutoff offset for YPbPr input. Range : 0 to 511.

52-F BC YPBPR

Blue Cutoff offset for YPbPr input. Range : 0 to 511.

53-F GC YPBPR

Green Cutoff Offset for YPbPr input. Range: 0 to 511.

VIDEO-FI 3

54-F YPBPROFS

Internal Brightness offset for YPbPr input. Range : 0 to 511.

55-F YFDEL

Luminance/Fast Blanking Delay for YPbPr input. Range : 0 to 127.

56-F UVDEL

PbPr Chroma Components Delay. Range : 0 to 127.

57-F USATADJ

Pb Chroma component saturation adjust. Range : 0 to 63.

FACTORY MENU

58-F VSATADJ

Pr Chroma component saturation adjust. Range : 0 to 63.

59-F LPFOP

Lines per Field Output. Only used for Freerun Mode. Range : 0 to 511.

60-F NAPPLOP

Not Active Pixel Per Line Output. Range : 0 to 511.

61-F HORPOS

Horizontal Picture Position. Range : 32 to 2047.

62-F HORWIDTH

Horizontal Picture Width. Range : 0 to 2047.

63-F VERPOS

Vertical Picture Position. Range : 0 to 1023.

64-F VERWIDTH

Vertical Picture Width. Range : 0 to 2047.

65-F HOUTDEL

Horizontal Sync. Output Delay. Range : 0 to 322.

66-F ON

Dynamic Contrast Improvement on/off. Range : 0 to 1.

67-F YDELMTCH

Luminance-Chrominance Delay Match. Range : -4 to 3.

68-F BLEMODE

Black Level Expansion Mode. Range : 0 to 3.

VIDEO-FI 4

69-F PKCRF

Peaking Coring. Range : 0 to 31.

70-F RFPEAK

Frequency Response of video peaking filter at 5Mhz. Range : -8 to 15.

71-F RF AGC

Tuner take over point. Range : 0 to 15.

72-F MAX CON

Register to limit the max value of Contrast Register. Range : 0 to 63.

73-F RF SBRT

Brightness adjust for final alignment. Range : 0 to 254.

74-F RF BLACK

Brightness register to set the initial condition for Brightness final alignment.

75-F RF WHITE

Contrast register to set the initial condition for Brightness final alignment.

76-F BRIGHTCH

Register to tune the RF Brightness Adjust Channel.

77-F A OFFSET

Register to readjust the brightness in the CV Aux. Source.

78-F SVM G

Scan Velocity Modulator circuit Gain. Range : 0 to 63.

79-F SVM D

Scan Velocity Modulator Delay. Delay between SVM signal and analog RGB outputs in half clock steps. Range : 0 to 15.

80-F SVM L

Scan Velocity Modulator Limiter. The SVM output signal is limited to $\pm(SVLIM+1)*2$. Range : 0 to 63

81-F GAMMA

Gamma correction value. Range : -512 to 511.

82-F TML

Start Line for Tube Measurement. Range : 0 to 511.

83-F WDRM

RGB Level for White Drive Current Measurement. Range : 0 to 1023.

VIDEO-FI 5

84-F IBRM

Internal Brightness for Measurement. Range : 0 to 511.

85-F SMODE

Sense Mode. Register to toggle between SENSE pin or RSW1 pin for BCL Measurement. Range : 0,1.

86-F CUT DIS

Register to enable or disable the Cutoff measurement Loop. Range : 0,1.

87-F WDR DIS

Register to enable or disable the White Drive Measurement Loop. Range : 0,1.

FACTORY MENU

88-F ULBLK DIS

Register to toggle between Black or ultrablack during Blanking. Range : 0,1.

89-F PRED CH

Register to Choose the default channel during Predominant Color Adjustment.

90-F R CUT

Reference for Cutoff Red. Range : 0 to 511.

91-F B CUT

Reference for Cutoff Blue. Range : 0 to 511.

92-F G CUT

Reference for Cutoff Green. Range : 0 to 511.

93-F R GAIN

Reference for White Drive Red. Range : 0 to 511.

94-F B GAIN

Reference for White Drive Blue. Range : 0 to 511.

95-F G GAIN

Reference for White Drive Green. Range : 0 to 511.

96-F CUT GAIN

Gain for Cutoff Control Loop. Range 0 to 511.

97-F WDR GAIN

Gain for White Drive Control Loop. Range : 0 to 511.

98-F BCLTHRES

Beam Current Limiter Threshold Current. Range : -4096 to 4095.

VIDEO-FI 6

99-F BCLTC

Beam Current Limiter Time Constant. Range : 0 to 511.

100-F BCLMIN C

BCL Minimum Contrast. The Beam Current Limiter will stop reducing the contrast at BCL_MIN_C level and will continue by reducing Brightness. Range : 0 to 511.

101-F NOOSDBCL

BCL function for analog RGB. Register to enable or disable the BCL function for OSD or External RGB. Range : 0,1

102-F HBST

Horizontal Blanking Start. Range : 0 to 1295.

103-F HBSO

Horizontal Blanking Stop. Range : 0 to 1295

104-F VBST

Vertical Blanking Start Line. Range : -127 to 343.

105-F VBSO

Vertical Blanking Stop Line. Range : 4 to 343.

106-F OSD CNTR

Analog Contrast for OSD and external RGB. Range : 0 to 511.

107-F OSD BRT

Analog Brightness for OSD and external RGB. Range : -256 to 255.

108-F TINT AUX

Internal Tint Control for Composite Video input source. Range : -128 to 127.

109-F TINT YC

Internal Tint Control for Luminance/Chrominance Video input source. Range : -128 to 127.

110-F ACCLIM V

Automatic Color Control Limitation for Composite Video input source. Range : 0 to 31.

111-F IFCOMBRF

IF Compensation Filter for RF input source. With off-air or mistuned reception, any attenuation at higher frequencies or asymmetry around the color subcarrier is compensated. Range : 0 to 7.

112-F IFCOMP V

IF Compensation Filter for Composite Video input source. Any attenuation at higher frequencies or asymmetry around the color subcarrier is compensated. Range : 0 to 7.

113-F IFCOMBYC

IF Compensation Filter for Luminance/Chrominance Video input source. Any attenuation at higher frequencies or asymmetry around the color subcarrier is compensated. Range : 0 to 7.

VIDEO-FI 7

114-F YCDELAUX

Luminance Delay for Composite Video input source. Range : -8 to 7.

FACTORY MENU

115-F YCDEL YC

Luminance Delay for Luminance/Chrominance Video input source. Range : -8 to 7.

116-F FIX G2

Register to set the default value of Brigh(Luma Offset) register during G2 adjustment.

117-F VAR G2

Register to set the default value of INT_BRT register during G2 adjustment.

118-F NTSC C

Register to set the default value of RGB Cutoff registers during G2 adjustment.

119-F NTSC G

Register to set the default value of RGB Gain registers during G2 adjustment.

120-F YPRPB C

Register to set the default value of RGB Cutoff registers during G2 adjustment for YPbPr input source.

121-F YPRPB G

Register to set the default value of RGB Gain registers during G2 adjustment for YPbPr input source.

122-F MAX COL

Register to set the high limit of the Customer Color Register.

123-F SUB COL

Register to set the Low Limit of the Customer Color Register.

124-F LMIXOFS

Mixing Coefficient Offset. Amplitude offset to start adaptive mixing. Range : 0 to 31.

125-F PKCF RF

Peaking Filter Center Frequency for RF input source. Range : 0,1,2,3

126-F LTIGAIN

Luma Transient Improvement Gain for RF input source. Range : 0 to 15.

127-F PKCF AUX

Peaking Filter Center Frequency for Composite Video input source. Range : 0,1,2,3

128-F LTI GAUX

Luma Transient Improvement Gain for Composite Video input source. Range : 0 to 15.

VIDEO-FI 8

129-F PKCF YC

Peaking Filter Center Frequency for Luminance/chrominance Video input source. Range : 0,1,2,3

130-F LTIG YC

Luma Transient Improvement Gain for Y/C input source. Range : 0 to 15.

131-F PKCFYPRP

Peaking Filter Center Frequency for Component Video input source. Range : 0,1,2,3

132-F LTIGYPRP

Luma Transient Improvement Gain for Component input source. Range : 0 to 15.

133-F MAX BRIGH

Register to set the high limit of the Customer Brightness register.

134-F PKC AUX

Peaking coring for Composite Video input source. Range : 0 to 31.

AUDIO - SW

135-F FM AM P

Prescale for the demodulated BTSC signal.

136-F SPAT GAIN

Spatial effect high pass GAIN

137-F SPAT MODE

Spatial effect mode

138-F EFF STRGT

Spatial effect strength.

139-F AIR AFT

Force to AFC when Air Band is the current selection.

140-F PRESET A

Used to store audio adjustments.

141-F PRESET P

Used to store video adjustments.

142-F FACTORY

Factory Mode.

143-F QUICK AUTOPR

Enable/Disable AFC searching when autoprogram is in CABLE Mode.

FACTORY MENU

ITEM	Register Name	Value (dec)	Description
Deflection 1			
0	VL	-70	Vertical Linearity
1	VA	-280	Vertical Amplitude
2	SC	140	S-Correction
3	VS	2	Vertical Position
4	HS	-53	Horizontal Position
5	EW	-66	Horizontal Width
6	ET	0	Trapezoidal
7	EP	-74	Pin Cushion
8	CRNU	0	Upper Corner
9	CRNL	0	Lower Corner
10	BOW	0	Bow
11	ANGLE	0	Angle
12	CRNU6	10	Upper Corner(6 TH)
13	CRNL6	12	Lower Corner(6 TH)
14	EHTH	150	EHT Compensation Threshold
Deflection 2			
15	EHT S	100	EHT Static Time constant
16	EHTV1	-17	Static Vertical Comp. (1 ST Gain)
17	EHTV2	-30	Static Vertical Comp. (2 ND Gain)
18	EHTH1	-3	Dynamic Horizontal Comp. (1 ST Gain)
19	EHTH2	-10	Dynamic Horizontal Comp. (2 ND Gain)
20	EHT F	1	EHT Dynamic Time constant
21	EHTP1	0	1st Gain for Dynamic Horizontal Phase
22	EHTP2	0	2nd Gain for Dynamic Horizontal Phase
23	OSD P	0	Horizontal Position from menus
Video-FI 1			
24	CLMPST	24	Clamping measurement Start 1
25	PLLTC	1	Horiz. PLL Time constant
26	YC DELAYRF	12	Luma Delay for RF input.
27	TINT RF	0	Internal Tint control for RF input
28	SCADJ	16	Chroma Sub-Carrier adjust
29	AGCMD	3	Automatic Gain Control Methode
30	ACCLIMRF	14	Automatic Color Control limitation for RF in.
31	CLRANGE	3	Chroma Lock Range
32	CDYUVIN	0	Color Decoder YUV input
33	CDYUVTINT	0	Color Decoder YUV Tint Control
34	DISCOMB	0	Disable/enable Comb Filter
35	VDG	1	Vertical Difference gain
36	HDG	2	Horizontal Difference Gain
37	VPK	0	Vertical Peaking Gain
38	REMDL2	0	Comb Filter compensation delay for ADC2
Video-FI 2			
39	REMDL1	0	Comb Filter compensation delay for ADC1
40	INCOMB	0	Comb Filter input select
41	YCTCOMB	0	YC Through Comb Filter
42	AGCADJ1	38	Manual AGC adjust for ADC1
43	AGCADJ2	32	Manual AGC adjust for ADC2
44	YUVMAT	0	Color Matrix for Component input
45	YUV TINT	0	Tint control for YUV input
46	YUV BRT	-22	Brighness Control for YPbPr input
47	YUV CON	44	Contrast Control for YPbPr input
48	RG YPBPR	254	Red gain offset for YPbPr input
49	BG YPBPR	254	Blue gain offset for YPbPr input
50	GG YPBPR	254	Green gain offset for YPbPr input

FACTORY MENU

ITEM	Register Name	Value (dec)	Description
51	RC YPBPR	254	Red cutoff offset for YPbPr input
52	BC YPBPR	254	Blue cutoff offset for YPbPr input
53	GC YPBPR	254	Green cutoff offset for YPbPr input
Video-FI 3			
54	YPBPROFS	127	Internal Brightness offset for YPbPr input
55	YFDEL	59	Luma/Fast blanking delay for YPbPr input
56	UVDEL	57	PbPr Chroma components delay
57	USATADJ	42	Pb Chroma component saturation adjust
58	VSATADJ	42	Pr Chroma component saturation adjust
59	LPFOP	132	Lines per field output
60	NAPPLOP	0	Not active pixels per line output
61	HORPOS	150	Horizontal picture position
62	HORWIDTH	1080	Horizontal picture width
63	VERPOS	1	Vertical picture position
64	VERWIDTH	313	Vertical picture width
65	HOUTDEL	296	Horizontal sync. output delay
66	ON	1	Dynamic Contrast Improvement on/off
67	YDELMTCH	4	Luminance/chrominance Delay Match
68	BLEMODE	0	Black Level expansion mode
Video-FI 4			
69	PKCRF	31	Peaking coring
70	RFPEAK	-4	Video peaking filter
71	RF AGC	8	Tuner take over point
72	MAX CONT	63	Max. limit for customer contrast control
73	RF SBRT	127	Brightness adjust for final alignment
74	RF BLACK	-146	Set the initial Brightness condition for brightness adj.
75	RF WHITE	30	Set the initial Contrast condition for brightness adj.
76	BRIGHTCH	11	Set the channel for Brightness adjustment
77	A OFFSET	110	Composite video Brightness adjustment
78	SVM G	12	SVM Gain
79	SVM D	7	SVM Delay
80	SVM L	27	SVM Limiter
81	GAMMA	-20	Gamma correction Value
82	TML	14	Start Line for Tube Measurement
83	WDRM	0	RGB level for white drive current measurement
Video-FI 5			
84	IBRM	320	Internal Brightness for measurement
85	SMODE	0	Sense Mode
86	CUT DIS	0	Enable/Disable the Cutoff measurement loop
87	WDR DIS	0	Enable/Disable the white drive measurement loop
88	ULBLKDIS	0	Toggle between Black or Ultrablack during Blanking
89	PRED CH	4	Set the default channel during predominant color Adj.
90	R CUT	90	Depend on adjustment
91	B CUT	90	Depend on adjustment
92	G CUT	90	Depend on adjustment
93	R GAIN	254	Depend on adjustment
94	B GAIN	254	Depend on adjustment
95	G GAIN	254	Depend on adjustment
96	CUT GAIN	0	Gain for Cutoff Control Loop
97	WDR GAIN	0	Gain for White Drive Control Loop
98	BCLTHRES	301	Beam Current Limiter Threshold Current
Video-FI 6			
99	BCLTC	511	Beam Current Limiter Time Constant
100	BCLMIN C	230	BCL Minimum Contrast.

FACTORY MENU

ITEM	Register Name	Value (dec)	Description
101	NOOSDBCL	1	BCL function for analog RGB. Register to enable or disable the BCL function for OSD
102	HBST	1207	Horizontal Blanking Start.
103	HBSO	162	Horizontal Blanking Stop
104	VBST	254	Vertical Blanking Start Line.
105	VBSO	16	Vertical Blanking Stop Line
106	OSD CNTR	270	Analog Contrast for OSD and external RGB
107	OSD BRT	120	Analog Brightness for OSD and external RGB
108	TINT AUX	0	Internal Tint Control for Composite Video input source
109	TINT YC	0	Internal Tint Control for Luminance/Chrominance Videosource
110	ACCLIM V	14	Automatic Color Control Limitation for Composite Video input
111	IFCOMBRF	2	IF Compensation Filter for RF input source
112	IFCOMB V	4	IF Compensation Filter for Composite Video input source
113	IFCOMBYC	4	IF Compensation Filter for Luminance/Chrominance
Video-FI 7			
114	YCDEL AUX	14	Luminance Delay for Composite Video input
115	YCDEL YC	14	Luminance Delay for Luminance/Chrominance
116	FIX G2	127	Default value of Brigh (Luma Offset) register during G2 adj
117	VAR G2	-115	Default value of INT_BRT register during G2 adjustment.
118	NSTC C	90	Default value of RGB Cutoff registers during G2 adjustment.
119	NSTC G	250	Default value of RGB Gain registers during G2 adjustment.
120	YPRPB C	254	Default value of RGB Cutoff registers during G2 adjustment for YPrPb
121	YPRPB G	254	Default value of RGB Gain registers during G2 adjustment for YPrPb
122	MAX COL	54	set the high limit of the Customer Color Register
123	SUB COL	31	to set the Low Limit of the Customer Color Register
124	LMIXOFS	31	Mixing Coefficient Offset.
125	PKCF RF	0	Peaking Filter Center Frequency for RF input
126	LTIGAIN	7	Luma Transient Improvement Gain for RF input
127	PKCF AUX	0	Peaking Filter Center Frequency for Composite Video
128	LTIG AUX	7	Luma Transient Improvement Gain for Composite Video
Video-FI 8			
129	PKCF YV	0	Peaking Filter Center Frequency for Luminance/chrominance
130	LTIG YC	7	Luma Transient Improvement Gain for Y/C input
131	PKCFYPRP	0	Peaking Filter Center Frequency for Component Video
132	LTIGYPRP	7	Luma Transient Improvement Gain for Component input
133	MAX BRIGTH	40	Register to set the high limit of the Customer Brightness register.
134	PKC AUX	31	Peaking coring for Composite Video input source
Audio - SW			
135	FM AM P	24	Prescale for the demodulated BTSC signal
136	SPAT GAIN	2	Spatial effect strength
137	SPAT MODE	2	Spatial effect mode
138	EFF STRGT	63	Spatial effect high pass gain
139	AIR AFT	0	Force to AFC in Air Band
140	PRESET A	1	Used to store Audio adjustments
141	PRESET P	1	Used to store Video adjustments
142	FACTORY	0	Factory Mode
143	QUICK AUTOPR	0	Enable/Disable AFC searching when autoprogram is in CABLE mode

SERVICING

GENERAL INFORMATION

Servicing the Digital CL is the same as with other LG single-board chassis. If the set is dead, first check the standby and switched voltages. If the switched voltages do not appear, check the power "On" circuit. If the power supply is OK and the set will turn on, the Horizontal sweep circuit should be checked next. Is horizontal drive available from the video processor chip. If the sweep system does not start up, sweep-derived voltages will not be generated.

If the sweep and high-voltage circuits are OK and video or audio are missing, then the audio/video/tuner circuits should be checked. If the receiver is working but some feature is not working, check the Service Menu. Bring up the Service menu and check to be sure that all items are set correctly.

MODULE-LEVEL SERVICING

The Digital CL Chassis is Module Level repair only. Replacement modules are available on an exchange basis. If the CRT or Video processor IC are replaced, Black/White tracking must be reset. Refer to the Service Menus section of this book for Black/White tracking adjustments.

When troubleshooting video circuits, remember that all video travels through the Video/Audio switcher IC. A defect in either of these IC's can result in no video.

SERVICING THE POWER SUPPLY

Check the standby voltages first:

- +V1 at CX3456 (usually 169.7 VDC when 120 VCA)
- +11VSB at CX3610
- +11LSP at CX3611
- +5VSB at CX3802
- +3.3VSB at CX3806
- +1.8VSB at CX3811

Check the following:

- Keyboard input at IC100 pin 51.
- IR input at IC100 pin 50.
- Power On output at IC100 pin 49.

Check the switched voltages:

- B+ (110VDC) at CX3854
- +35VSW at CX3663
- +33VSW at ZDX3860
- +17VSW at CX3662
- +14VSW after LX3851
- +11VSW at ZDX3865
- +9VSW at CX3865

- +8VSW at ZDX3870
- +5VSW at CX3856
- +3.3VSW at CX3850
- DD5V at C1711
- D3.3V at C1752
- DD2.5V at C1738
- DD1.8V at C1726
- C1.2V at C1719

SWEEP DERIVED VOLTAGES

- Video B+ (190 VDC) at C422
- +28VDC at C413
- +14VDC at C415
- 14VDC at C419

CRT FILAMENT

Check at pin 3 and 4 of connector CN2F5. This should read voltages between 6.0 and 6.4 volts AC on a true RMS meter.

MICRO AND VIDEO PROCESSOR IC100

Check the following key operating signals and voltages:

- Horizontal drive at pin 60.
- Vertical drive at pins 84, 85.
- R Out IC100 pin 76.
- G Out IC100 pin 72.
- B Out IC100 pin 71.
- Serial clock, Serial Data pins 57 and 58 respectively
- 3.3VSB at pins 65, 46.
- 1.8VSB at pins 43, 24.

VERTICAL CIRCUIT

Check the following at IC301.

- Vertical drive VA at pin 7.
- Vertical drive VB at pin 6.
- Vertical out at pin 5.
- +14VDC at pin 1.
- 14VDC at pin 4.

HORIZONTAL CIRCUIT

Check the following:

- Horizontal drive to base of R402 driver.
- Driver transformer output at base of QX401.
- Shutdown voltage at collector of Q403.

SERVICING

SHUTDOWN CIRCUIT OPERATION

The flyback pulse voltage from pin 10 of T402 (Flyback Transformer) is peak detected (rectified) by the action of diode D444 and capacitor C450. This form a DC voltage appearing on C450 representative of the CRT anode voltage (HV) produced by T402. This voltage is divided down by precision resistors R419, R423, R420 and R424. This lower voltage appears on the zener diode ZDX447; when this voltage exceeds by 0.7 Vdc the "zener voltage" Q403 enters in saturation mode end then the HV shutdown occurs (pin 49 of IC100).

CRT ANODE HIGH VOLTAGE MEASUREMENT PROCEDURE

Each CRT screen size has it's own safe operating anode and shutdown voltage. Critical safety component (designated with an 'X' in the component designator) are designed to operate the CRT at a safe operating anode voltage and provide proper shutdown thresholds. If replacement of any of these components are deemed necessary, it is important to use original type LG Electronics components. After replacement is made, confirm proper anode voltage using the following procedure.

Measurement of the CRT anode voltage must be performed using a high impedance-high voltage meter, with no raster on the screen, and operating at nominal horizontal frequency, 15.75 Khz (NTSC signal).

After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode. Turn the television 'on' and confirm a good signal is being displayed. Reduce Brightness and Contrast settings until the picture is well extinguished.

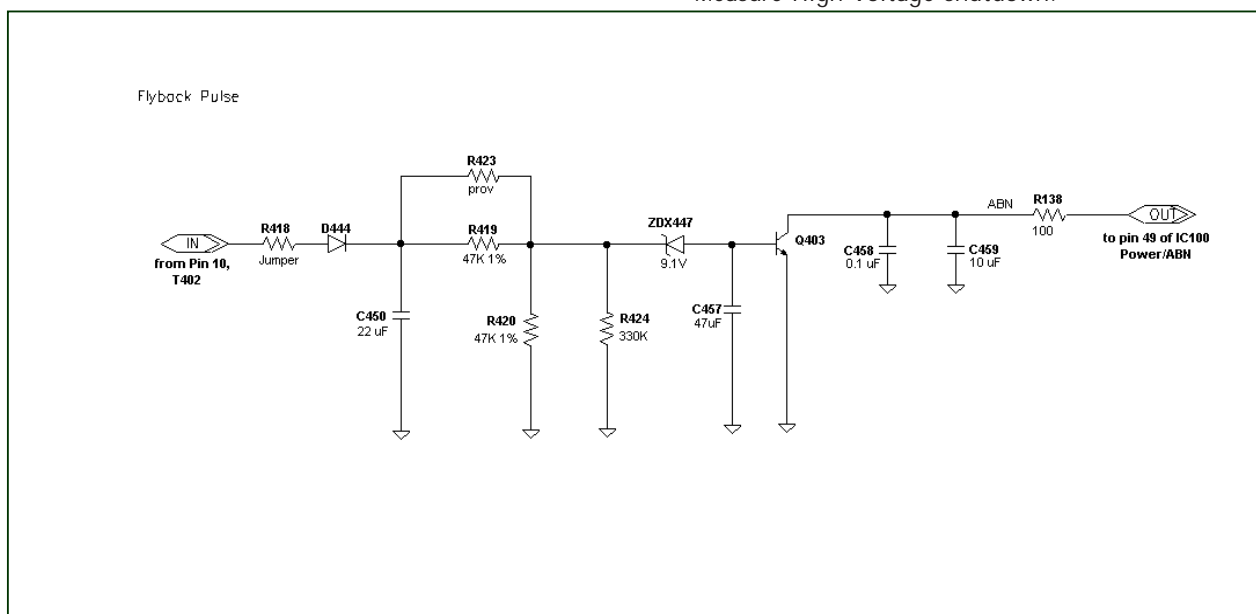
Observe the anode voltage meter reading and compare with the table below for the proper CRT screen size. If the voltage reading is higher than the maximum, verify circuit component values and proper operation.

CRT Anode Voltage		
CRT Screen Size	Nominal Anode Voltage (KV)	Max. Shutdown Voltage (KV)
27"	30 ± 1.0	36

COMPONENTS WITH ANY INFLUENCE IN HV INCREASE
<i>Fly-Back Transformer</i>
<i>Deflection Yoke</i>
<i>CX404</i>
<i>CX406</i>
<i>CX405</i>
<i>ICX3751</i>

HV SHUTDOWN PROCEDURE.

- After discharging the CRT, connect a high impedance-high voltage meter to the CRT anode
- Remove jumper wire from RX3750.
- Connect a variable Resistor (1 Mohm) in location RX3750.
- Access **Video Menu** and adjust Brightness and Contrast controls for minimum screen luminance (beam current to 0 mA).
- Wait until the **Video Menu** or display disappear.
- Increase (from zero) slowly the resistance value until shutdown occurs.
- Measure High Voltage shutdown.



SERVICING

IF SERVICING

RF signal path is as follows:

The first stage is the TV Tuner (TU100). This device tunes and down converts any input channel frequency to a fixed value of 45.75 MHz for the Video RF carrier. The tuner output signal is called Intermediate Frequency (IF) and goes to a discrete amplifier (Q102) which rises the IF amplitude by 12db approximately, this IF amplification is required to counteract the losses of the next stage called the saw filter (U100) which is a band pass filter with sharp out band attenuation required to prevent adjacent channel disturbances going into the IF amplifiers in the one chip IC.

The IC100 is an all in one chip and contains all the succeeding stages for the RF signal up to be converted to composite video.

The IF stage is alignment free so, no adjustments are necessary for good performance.

The precise 20.25MHz +/- 20ppm clock frequency required for all internal conversions is obtained from the stable crystal oscillator (X100) and carefully choice of load capacitors C137 and C138 (22pF).

The only accessible register in the factory menu is available to adjust the TOP for the tuner AGC delay. The factory default value is "8".

This value can be reviewed by accessing the "Factory Menu", then choose "VIDEO-FI 4" and check register "71-F RF AGC 8".

The IF stable level (due to AGC Action) is internally passed on to the video detector, the resultant CV signal goes to the internal Video Switch which in turn makes the required video input selection.

Required power supplies for tuner are +5V at pin 7, +33V at pin 9, +4.2V at pin 1.

Pin 1 is the AGC control for the tuner and its value is variable depending of the input signal strenght, high signal values will result in AGC voltages close to 0, low or no signal input will result in AGC voltages close to 4.2V.

It is possible to check the tuning functionality of the tuner device by monitoring the DC voltage at pin 2.

This voltage varies from 1 to 30 volts depending of the tuned channel.

The IC2 control bus for the tuner is at pins 4 and 5. The IF output is at pin 11.

G2 ADJUSTMENT

We have two methods to make this adjustment on the field.

a) With the LG remote control (P/N: 105-201M) to make the next steps:

1. No test pattern required.
2. The video settings s/b in preset mode.
3. Press ADJ key in remocon, to display a factory adj menu on screen.
4. Using the Up/Down channel arrows to select "G2 ADJUSTMENT" legend.
5. With -/+ volume arrows to show a horizontal line.
6. Adjust the G2 potentiometer to get a barely visible horizontal line on screen.
7. Press ENTER or EXIT keys in the remote control to exit.

b) Without the LG remocon (P/N: 105-201M) to make G2 adj as follows:

1. Set brightness and contrast in the Video menu to mid range.
2. Set color level minimum.
3. Connect the output of an NTSC generator to the antenna input on the receiver.
4. Select a color bar signal and turn color off. Adjust the G2 control so that the range of bar pattern starts from completely white (not overdriven) to black. Leave visible 6 of 8 bars.
5. Return color level control to its normal setting.

FOCUS ADJUSTMENT

1. Connect the output of an NTSC generator to the antenna input on the receiver.
2. Select white raster pattern.
3. Push menu key of remote control to observe the OSD.
4. Adjust focus potentiometer to obtain the best focus at letters of menu.

Compare this response with crosshatch, if necessary, balance between OSD & Crosshatch.

SERVICING

ADJUSTMENT OF RGB CUTOFF

Note: If the Main Module or the CRT has been replaced, G2 must be readjusted before adjusting the RGB Cutoff

1. Press INSTANT KEY on 105-201M remote control to enter to Factory Menu.
2. With Zenith Remote (P/N MBR3447CT) or LG Remote (P/N MBR3447LG). Hold Menu button for just a seconds until channel will be displayed. Enters 1, 9, 3, 7 "ENTER" buttons.
3. Connect the output of an NTSC generator to the antenna input of the receiver. Set the generator to a pure white signal, chroma off.
4. Set Factory menu registers #90, #91, and #92 to adjust cutoff controls.
5. Carefully observe which color is predominant on the CRT: Red, Green or Blue. Do not change the value of cutoff control of this color.
6. Adjust the other two cutoff controls to obtain color balance on the screen.
7. Select the color bars pattern from the Video generator and turn the chroma off. Check that the TV set displays 3/4 of gray scale from white to black. If black level is too high, readjust register #73, RF Sub Brightness don't move #77 Aux brightness Offset register.
8. Return the color level control to preset.
9. Disable the factory menu (Factory Mode item 0 must be set to 0). Select "Preset" in the Video Menu under picture preference.

SWITCHING PROCESS

Video switching is done between the CV inputs, the Y/C inputs and component inputs.

CAMPOR VIDEO enters at pin 39 of IC100.

REAR VIDEO enters at pin 38 of IC100.

IF VIDEO is switched internally on IC100.

Rear Y enters at pin 35 and C enter at pin 34

Also, Front Y enters at pin37 and Front C enters at pin 36 of IC100.

The second part of the switching is between:

YPrPb signals enter at pins 1, 3 and 5 of IC200 and

Superport "YPrPb" signals entering at pins 8, 10 and 11 of IC200.

SENSING AND PRIORITIES

The camport input always has first priority, it is sensed directly through the microprocessor. The S-Video input has the second level. The Y/C connector does the S-Video sensing. The third level corresponds to rear video and antenna signal (RF), they would be selected by remote control.

SERVICING

PURITY & CONVERGENCE SETUP PROCEDURE

PRELIMINARY SETUP

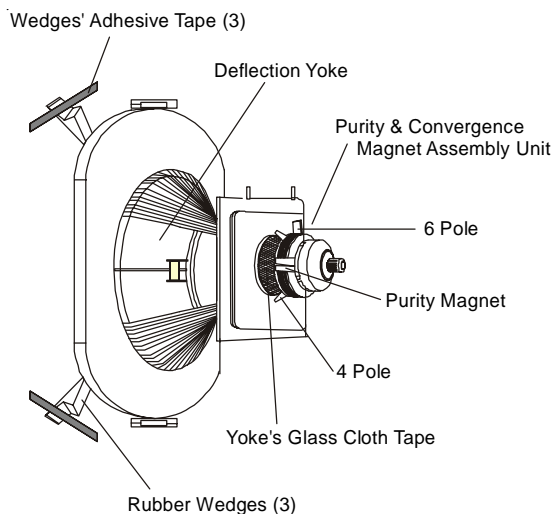
1. Allow the receiver to warm up for 15 to 20 minutes.
2. Degauss the CRT.
3. Connect a cross hatch generator to the receiver and "rough in" the static (center) convergence. Follow the Convergence Procedure.
4. Adjust for the focus.

PURITY ADJUSTMENT

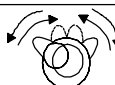
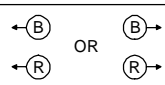
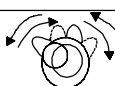
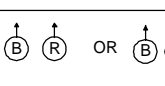

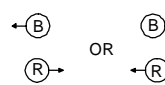
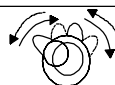
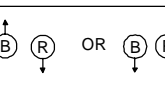
1. Purity tab positioning. Set the 2 pole purity tabs together in the 3 or 9 o'clock positions and the 4- and 6-pole purity tabs together in the 12 or 6 o'clock positions.
2. Move yoke to the maximum forward funnel position.
3. Next, switch the crosshatch generator to a red field.
4. Pull the yoke toward the rear of the CRT neck, keeping it centered, until a red raster is displayed.
5. If the red raster is not displayed as a pure red field, adjust the 2-pole purity tabs until a pure field is obtained.
6. Check for proper yoke tilt setting.

CONVERGENCE ADJUSTMENT

1. Release locking assembly.
2. Connect crosshatch generator to the receiver and adjust static (center) convergence as follows:
 - a. Adjust the 4-pole static control by moving the two tabs separately to converge the red and blue lines horizontally. Move the two tabs together around the neck of the CRT (in a 45° arc) from the top-dead-center position to converge the red and blue lines vertically.
 - b. After the 4-pole control has been adjusted to superimpose the red and blue lines on top of one another. Use the 6-pole static adjustment to place the converged red and blue lines over the green line. Move the two tabs together around the neck of the CRT (in a 30° arc) from the top-dead-center position to move the lines vertically. Adjusting the two tabs separately will move the converged beam to the left or right. Using a crosshatch generator capable of producing individual fields, adjust the generator to produce a red field. Use the purity tabs to center a red stripe.



CRT Ring Location Purity
Adjust Tabs Beam Movement
for Convergence

Ring Pairs	Rotation direction of Both Tabs	Movement of Red and Blue Beams
6 Pole	Opposite	 
Convergence R&B over G	Same	 
4 Pole	Opposite	 
Convergence R over B	Same	 

SERVICING

VERTICAL-TILT WEDGE ADJUSTMENT

The vertical lines at 6 and 12 o'clock are converged by vertically tilting the yoke and inserting a wedge at the top of the yoke until it is firmly seated between the CRT glass and the horizontal coils.

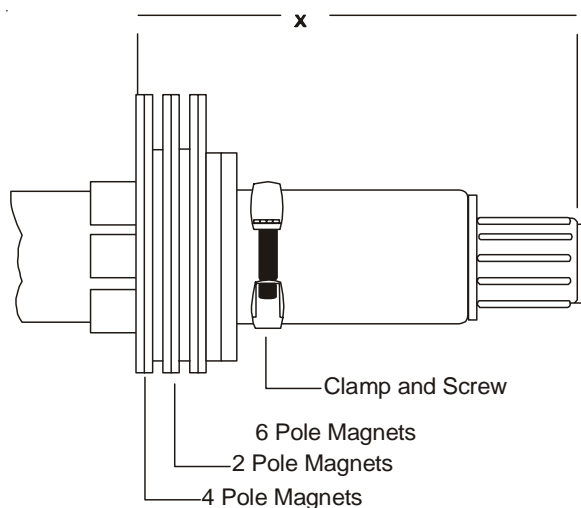
HORIZONTAL-TILT WEDGE ADJUSTMENT

The vertical lines at 3 o'clock and 9 o'clock are converged by horizontally tilting the yoke and inserting a wedge. Adjust first at 4 or 8 o'clock, whichever has the larger space, until the wedge is firmly seated between the CRT glass and yoke coils. Then, insert the 3rd wedge in the remaining horizontal tilt position until it is firmly seated between the CRT glass and yoke coils. Convergence at the 3 and 9 o'clock should be maintained during this operation.

When the 3 wedges are firmly installed and positioned for acceptable convergence, lock the wedges in place by applying a 2.5 inches long strip of tape across the tabs of each wedge firmly against the CRT glass. The CRT glass surface should be clean and free of dust and other foreign material.

UNUSUAL TILT CASE

There may be some instances where the picture tube and yoke will require vertical tilt in the opposite (up) direction to obtain convergence. In such cases, insert the vertical tilt wedge at the bottom (6 o'clock) position. Follow through on the horizontal tilt adjustment by using the 2 and 10 o'clock positions and secure wedge with a piece of tape, as described above.



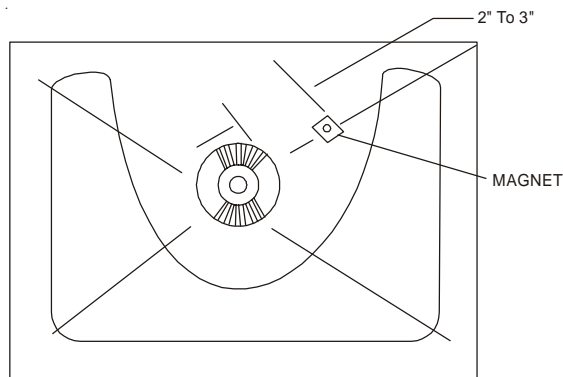
IMPROVING CRT CORNER PURITY

CRTs that display corner purity problems even after following the service procedures can be modified with a picture correction kit. The purity can be improved by placing a picture-correction magnet (included in the kit) on the CRT funnel. Refer to the following modification steps and illustration to place the magnet properly. Fully degauss the CRT before installing correction magnets.

MODIFICATION

1. Place the magnet on the CRT funnel as shown in the figure displayed below, in the quadrant exhibiting impurity.
2. Rotate the magnet in place to the position shown for best purity.
3. Piece a piece of 1/2" by 2" long Fiberglass tape over the magnet to hold it in place.
4. Degauss the CRT once magnet is in place to insure that the magnet is not over the internal magnet shield.

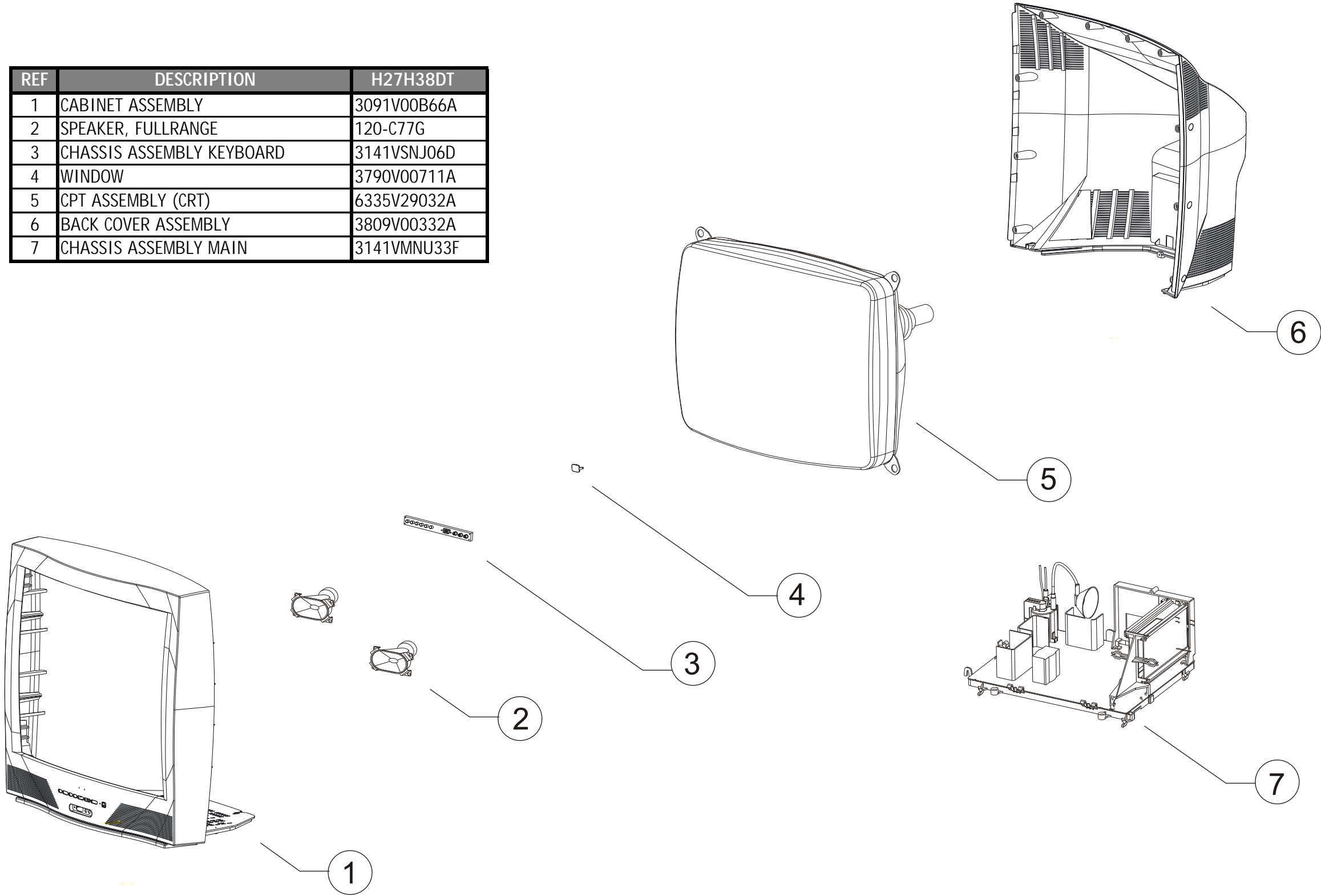
Note: If the magnet is placed over the internal magnet shield, any apparent purity correction will disappear after degaussing. Reposition the correction magnet off the internal shield and degauss again.



H27H38DT Exploded View

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

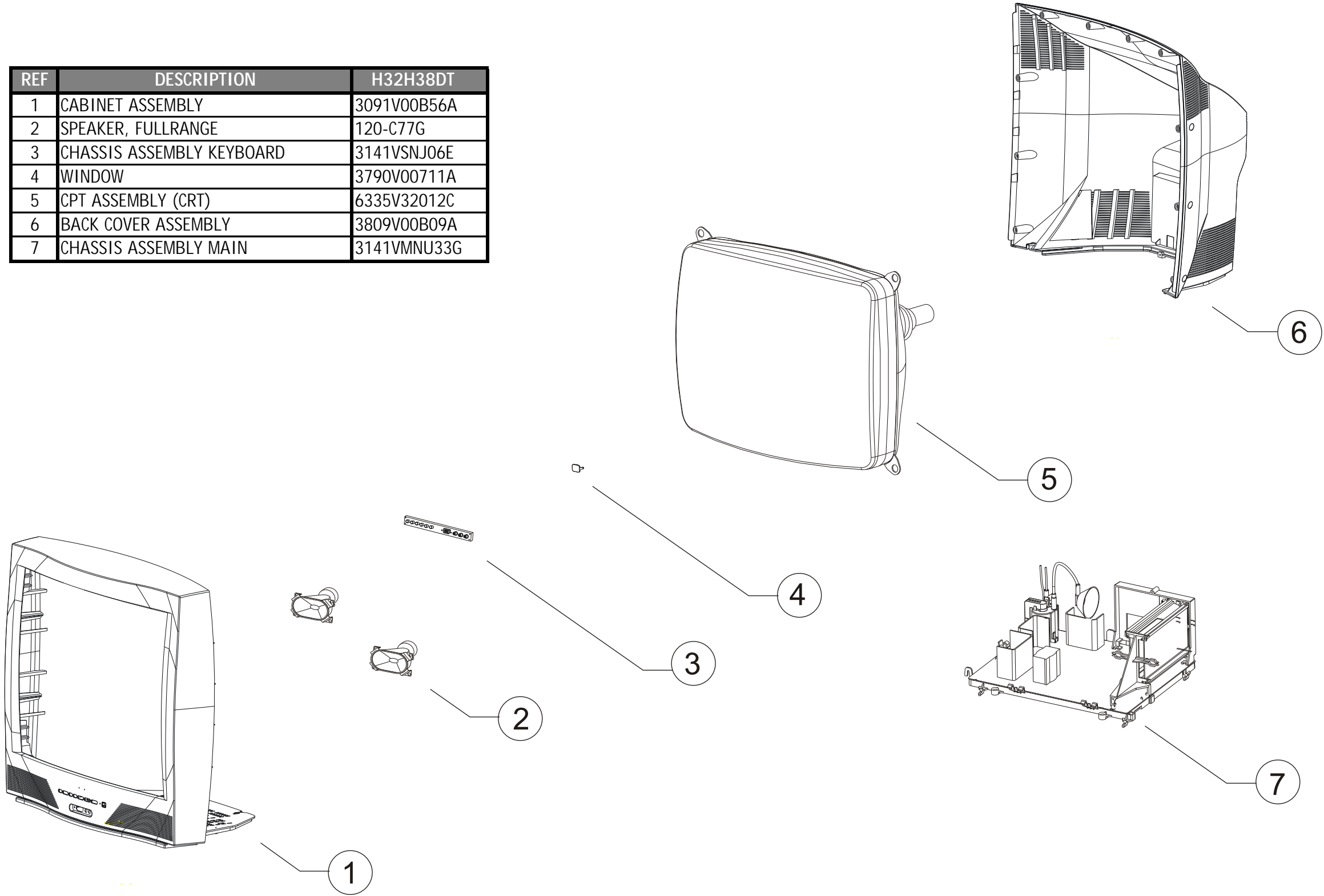
REF	DESCRIPTION	H27H38DT
1	CABINET ASSEMBLY	3091V00B66A
2	SPEAKER, FULLRANGE	120-C77G
3	CHASSIS ASSEMBLY KEYBOARD	3141VSNJ06D
4	WINDOW	3790V00711A
5	CPT ASSEMBLY (CRT)	6335V29032A
6	BACK COVER ASSEMBLY	3809V00332A
7	CHASSIS ASSEMBLY MAIN	3141VMNU33F



H32H38DT Exploded View

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

REF	DESCRIPTION	H32H38DT
1	CABINET ASSEMBLY	3091V00B56A
2	SPEAKER, FULLRANGE	120-C77G
3	CHASSIS ASSEMBLY KEYBOARD	3141VSNJ06E
4	WINDOW	3790V00711A
5	CPT ASSEMBLY (CRT)	6335V32012C
6	BACK COVER ASSEMBLY	3809V00B09A
7	CHASSIS ASSEMBLY MAIN	3141VMNU33G



Microprocessor

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G

F

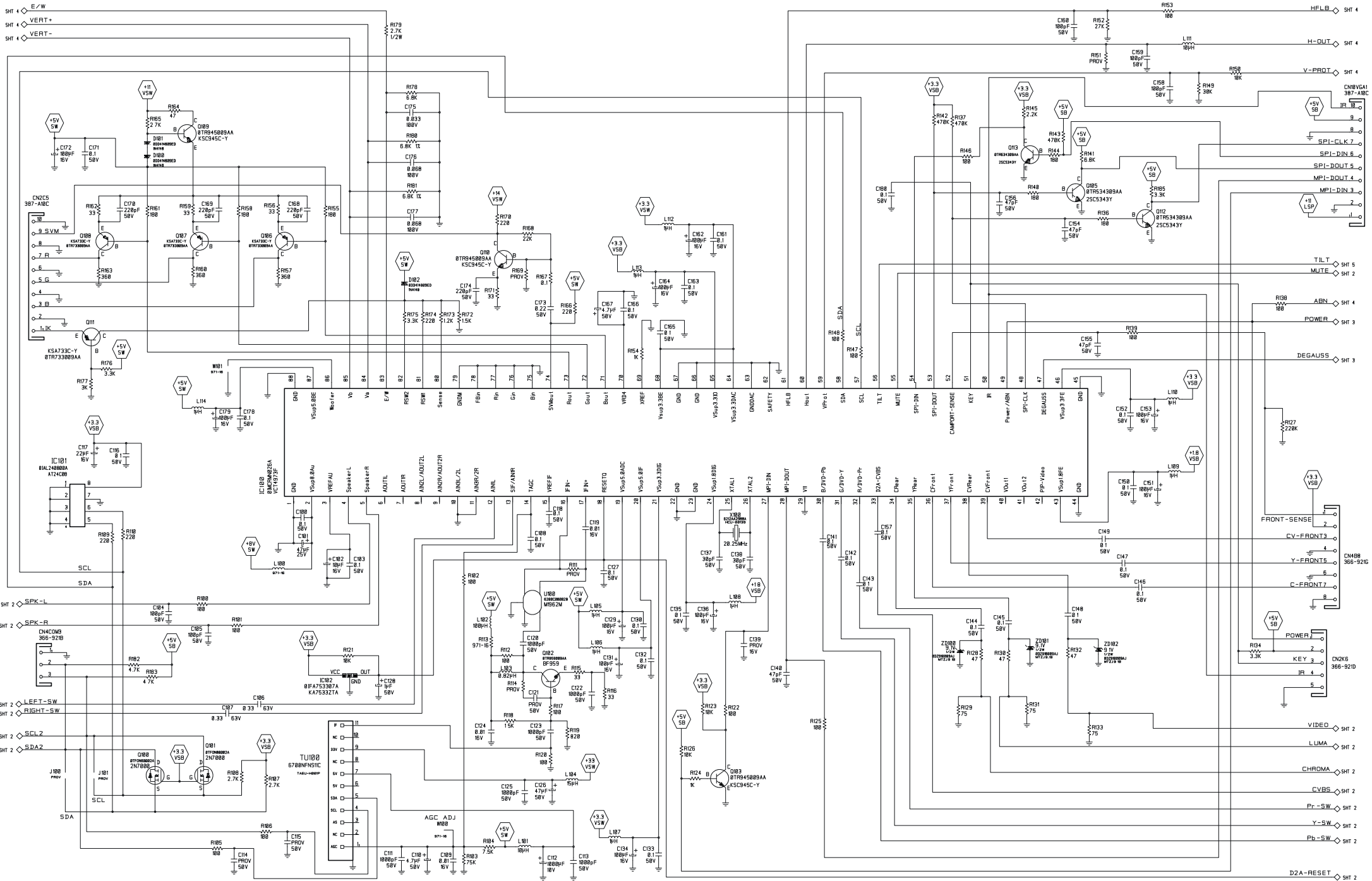
E

D

C

B

A



Audio

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G

F

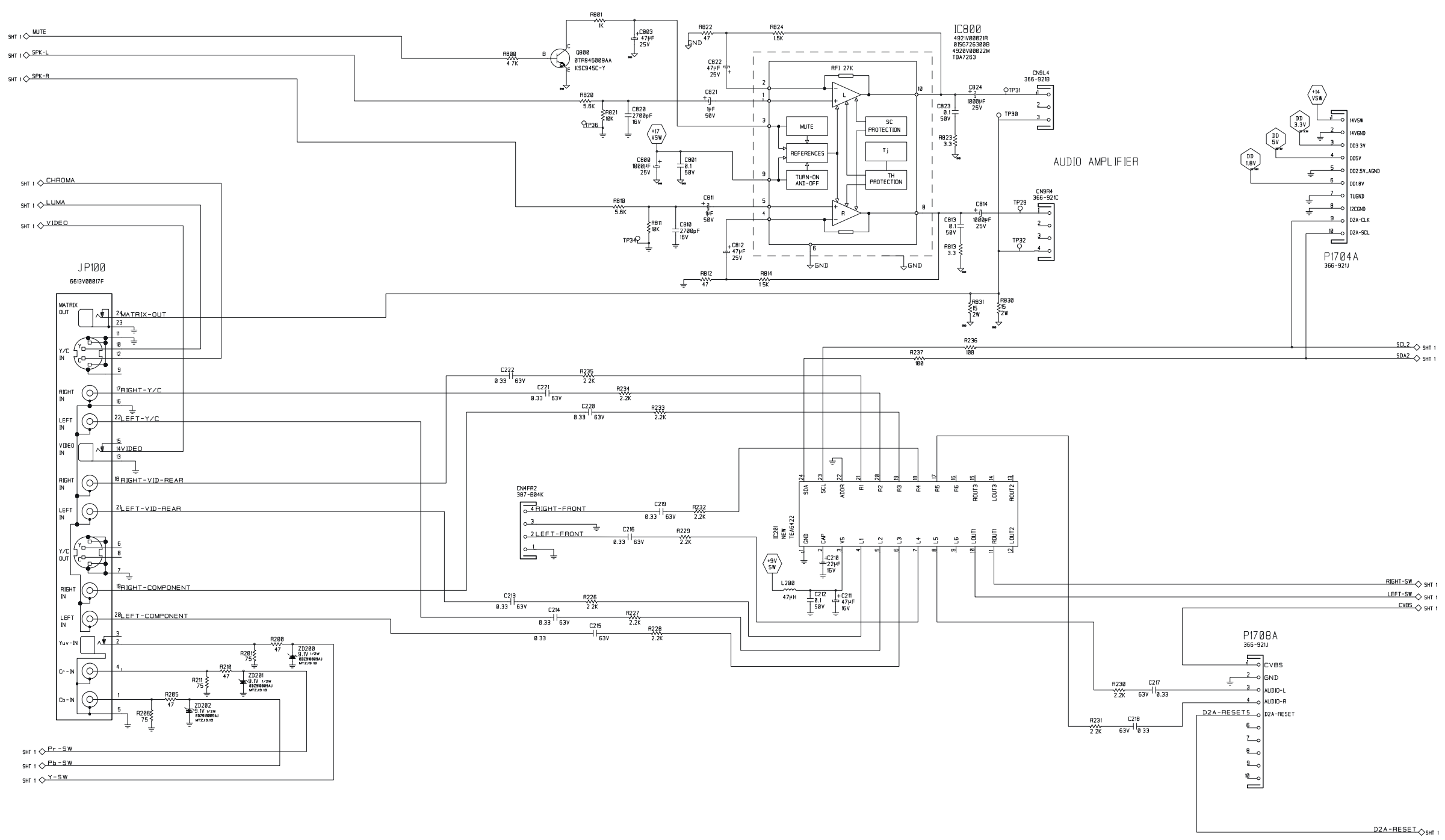
E

D

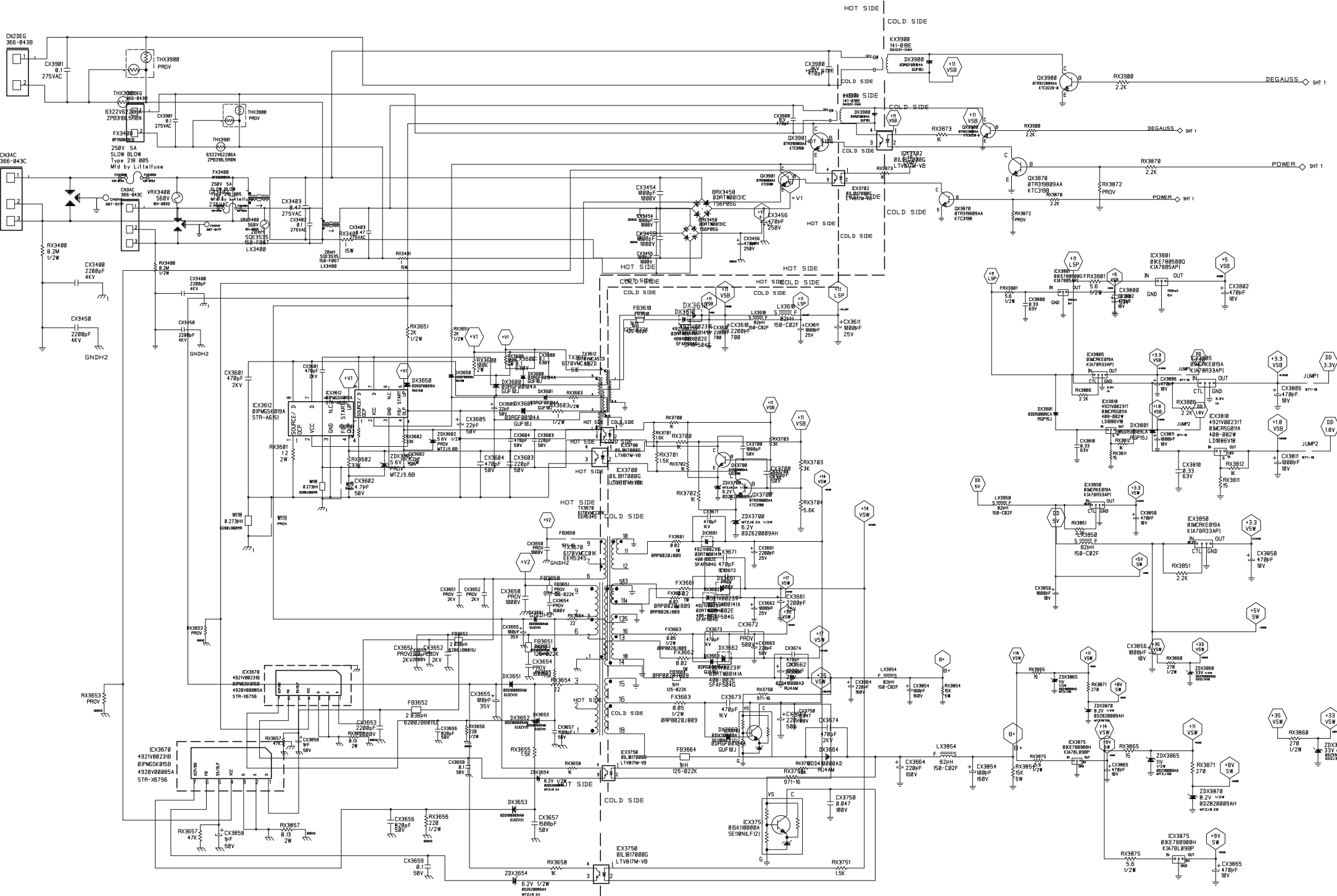
C

B

A



Power Supply



1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

DEFLECTION

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G

F

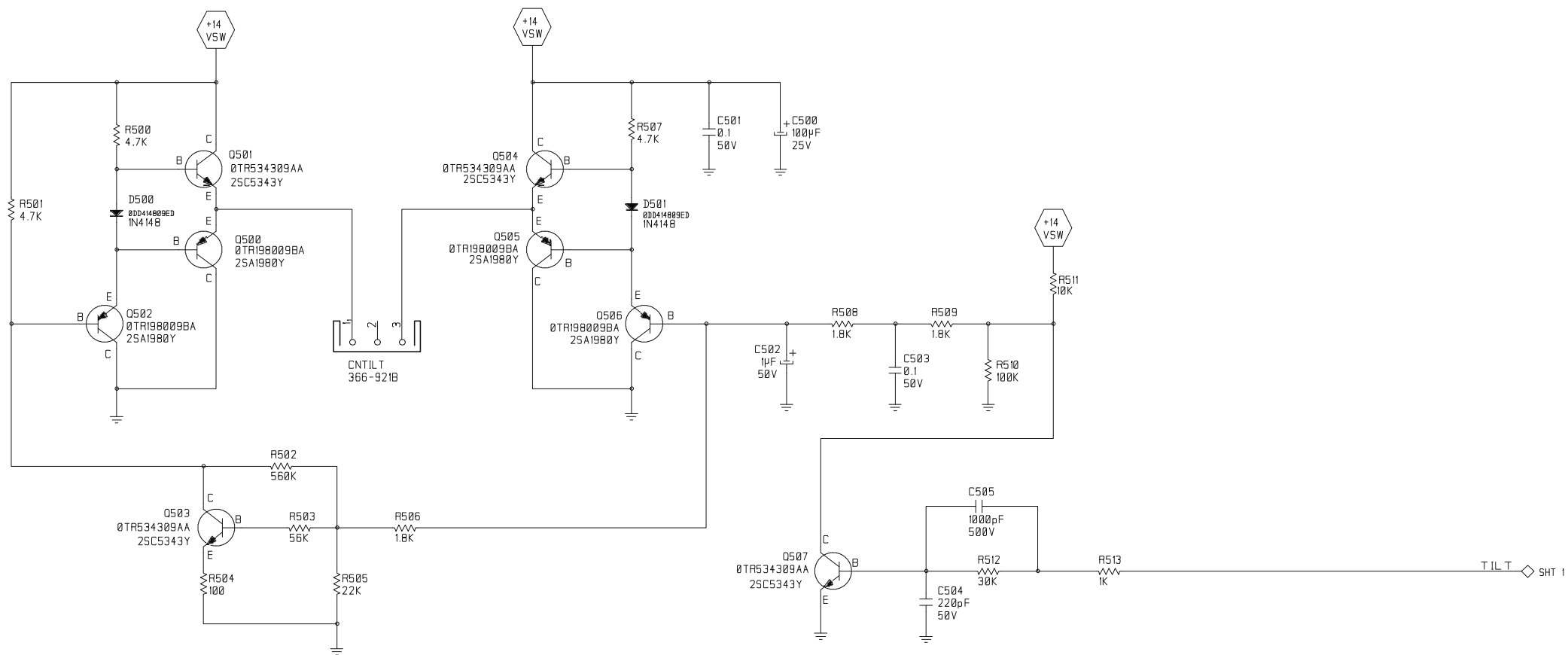
E

D

C

B

A



TILT CIRCUIT
OPTIONAL

MPI Card

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G

—

F

—

E

—

D

—

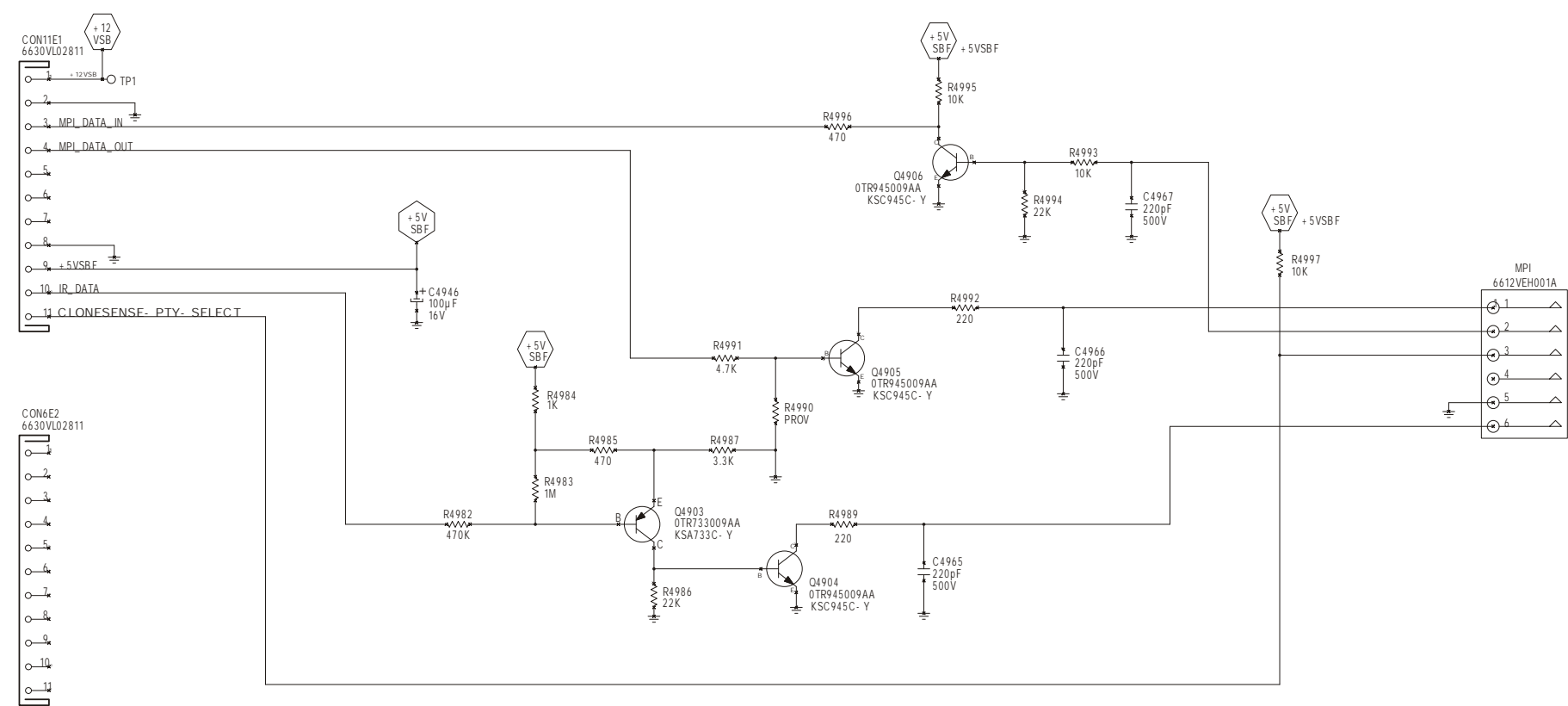
C

—

B

—

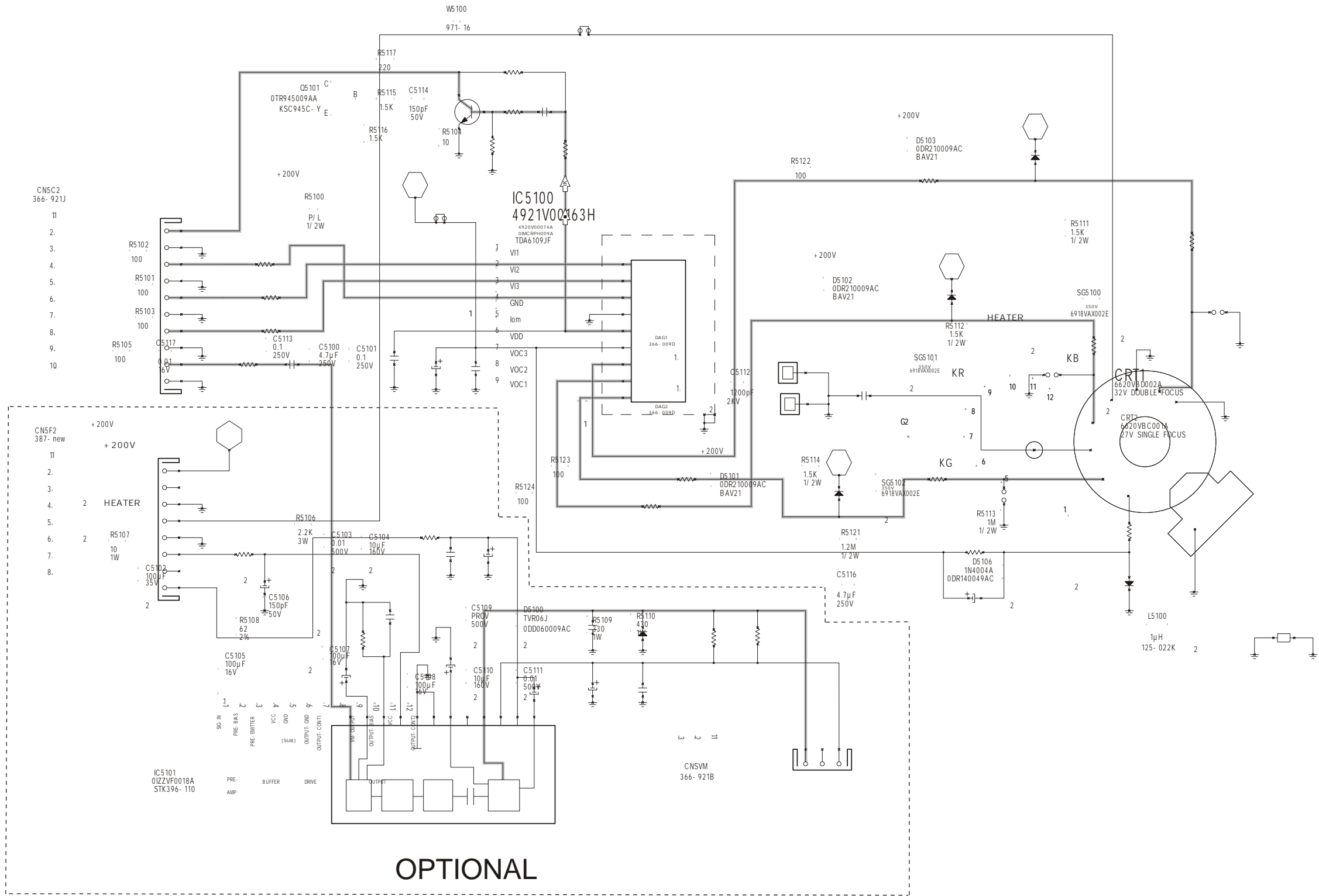
A



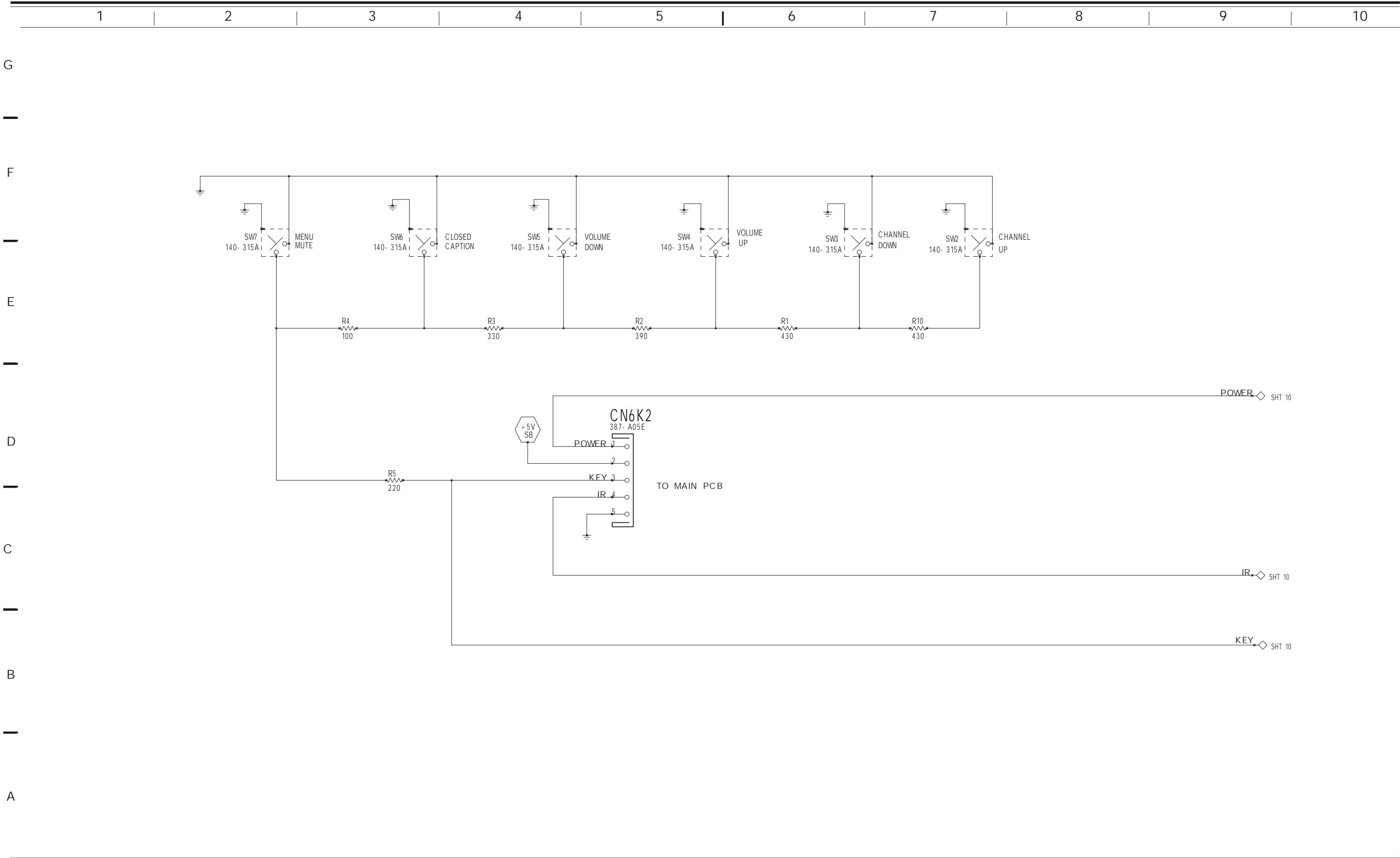
Video Output

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

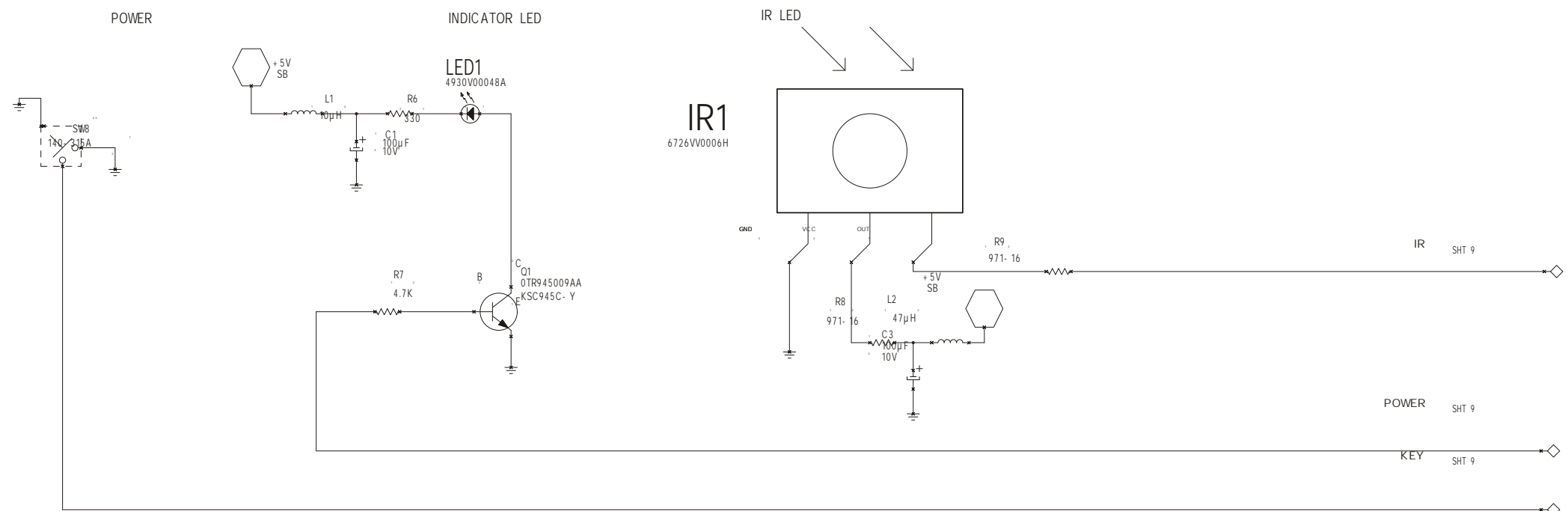
G
F
E
D
C
B
A



Keyboard



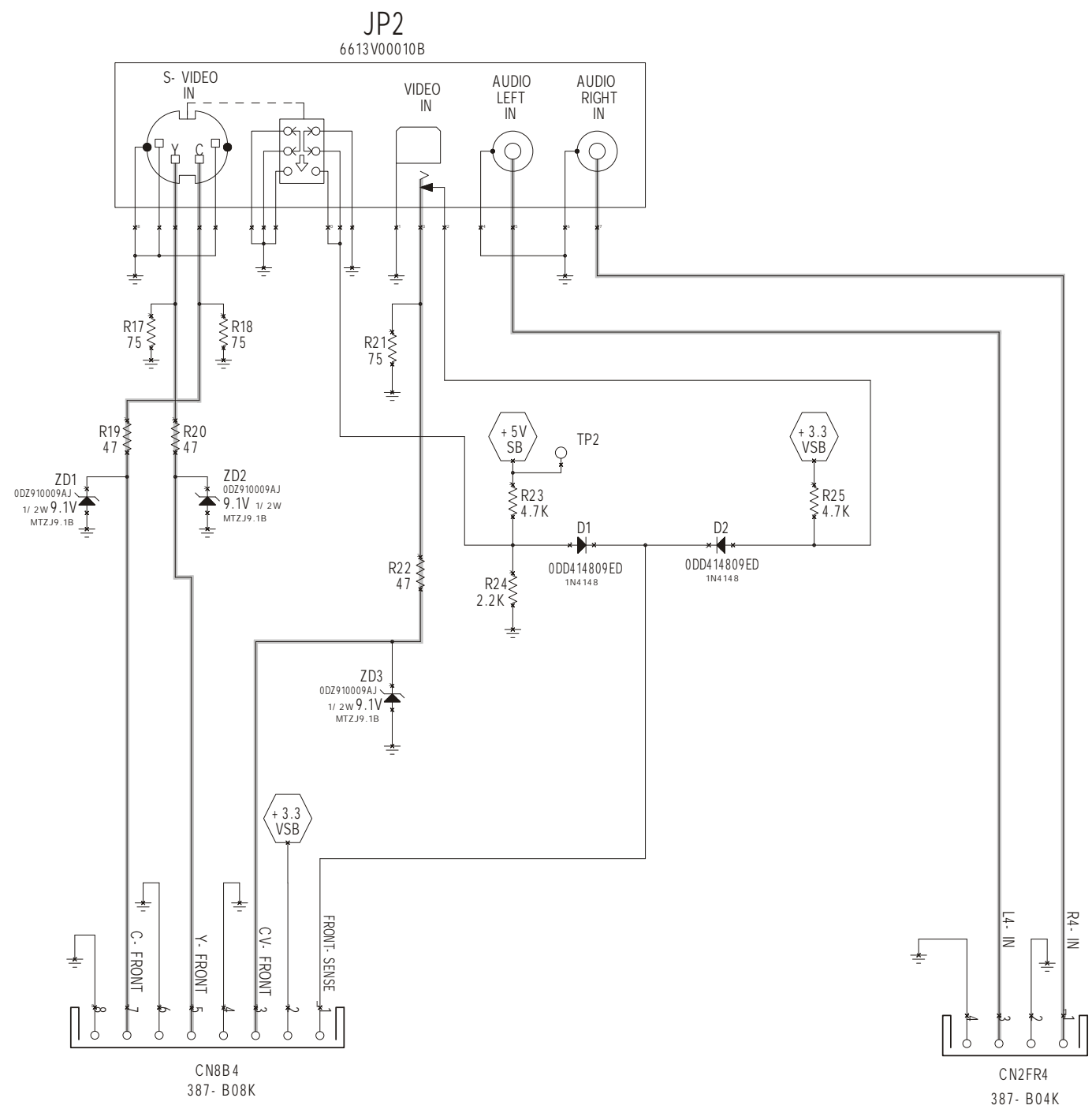
Ir Led Switch



Front Jack

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G
F
E
D
C
B
A



PCB Layout Top

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G

F

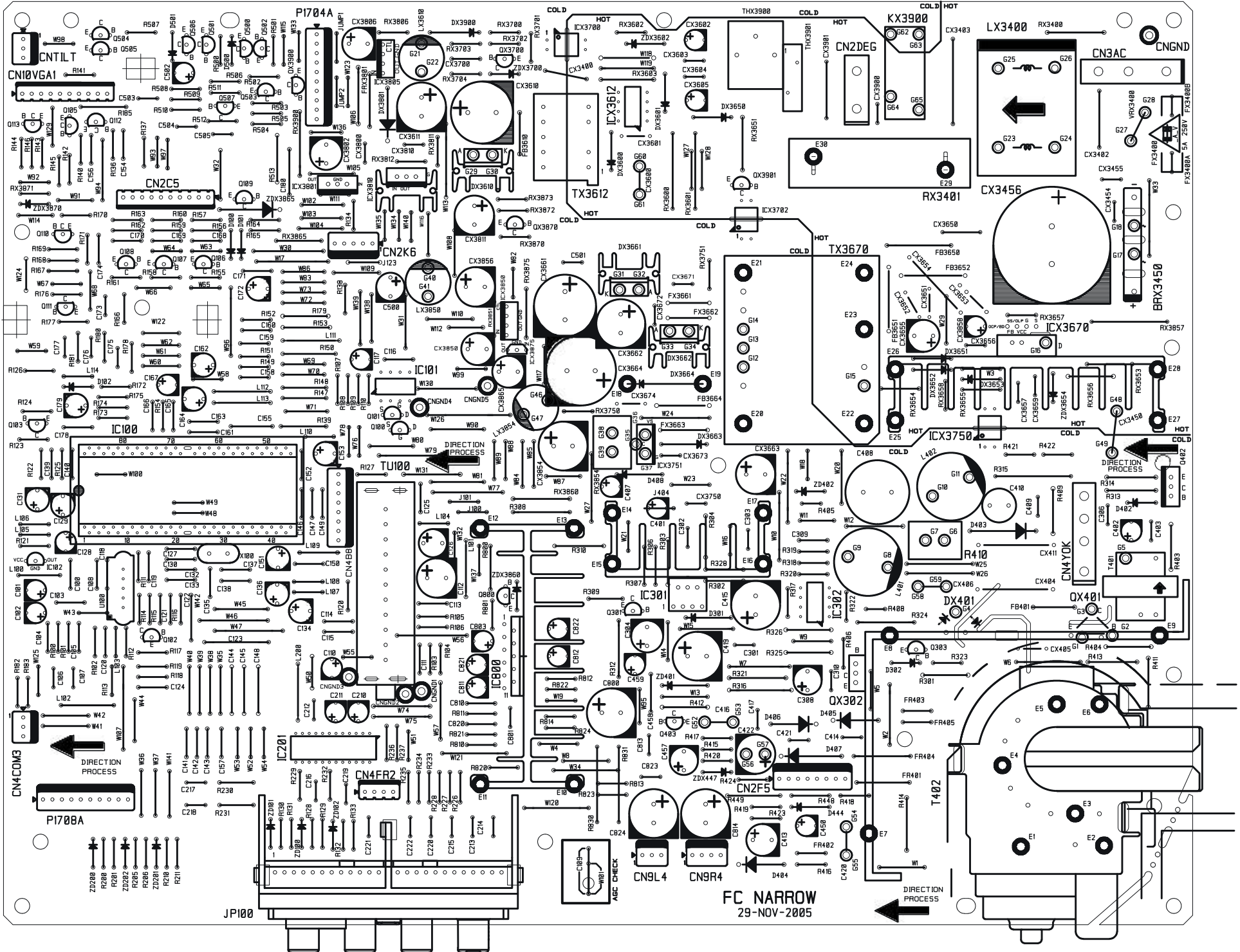
E

D

C

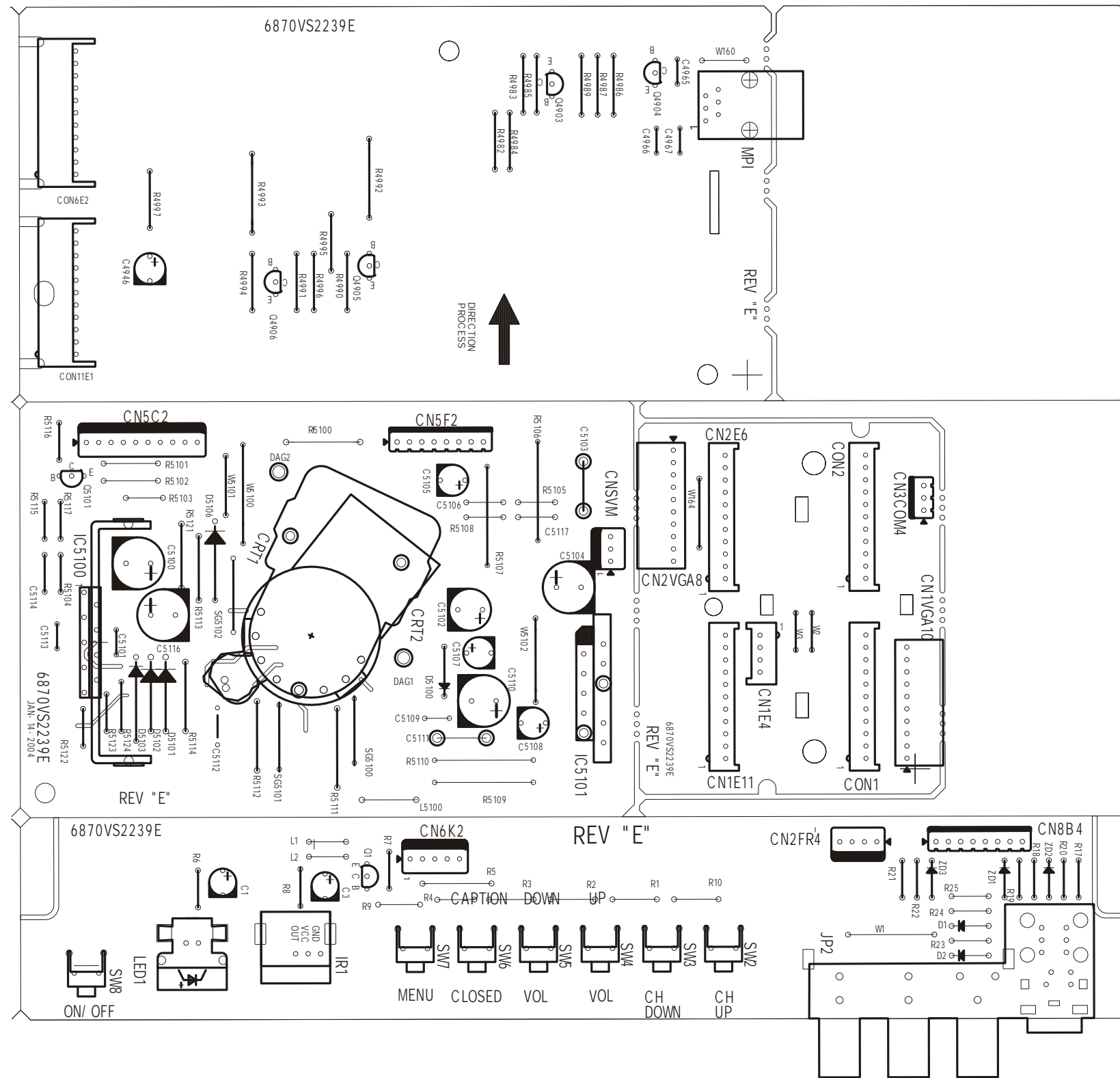
B

A



1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

A



A horizontal number line with tick marks for each integer from 1 to 10. The number 6 is marked with a thick vertical line, and the number 5 is marked with a thin vertical line.



G

F

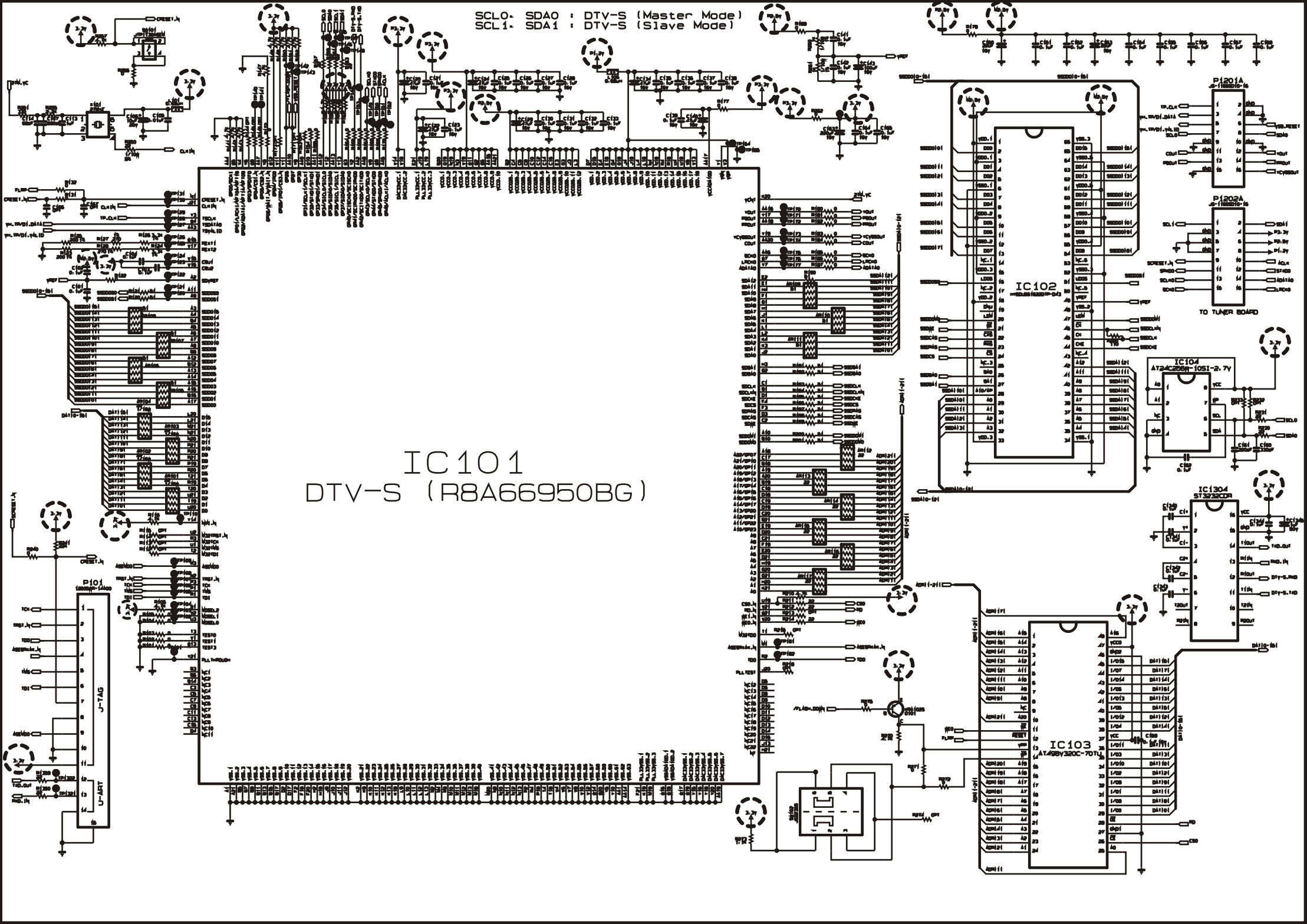
E

D

C

B

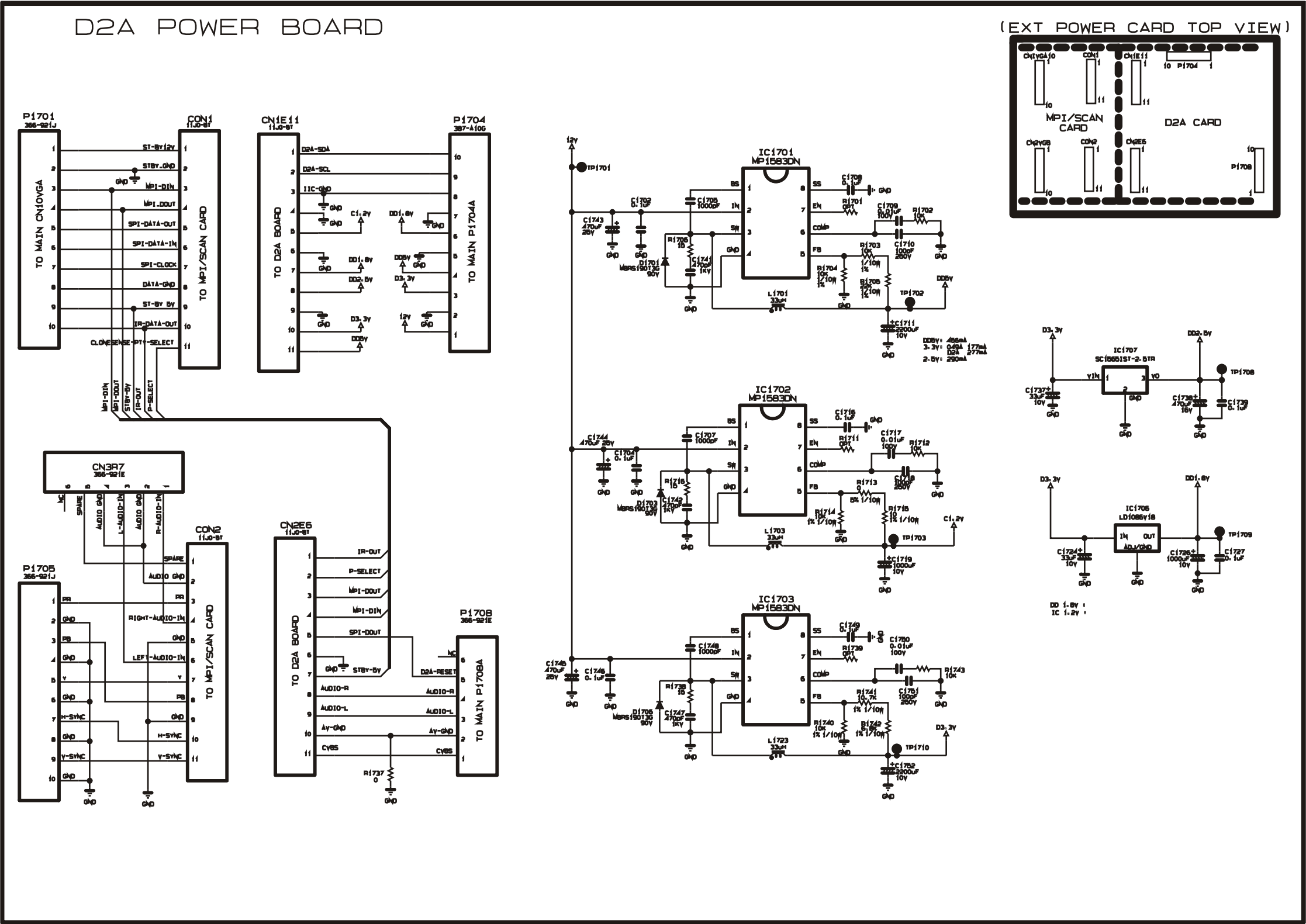
A



D2A POWER BOARD

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

G
F
E
D
C
B
A



TUNER INTERFACE

1 2 3 4 5 6 7 8 9 10

G
F
E
D
C
B
A

